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Test Monitoring Center

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

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

MEMORANDUM: 13-006

DATE: January 25, 2013

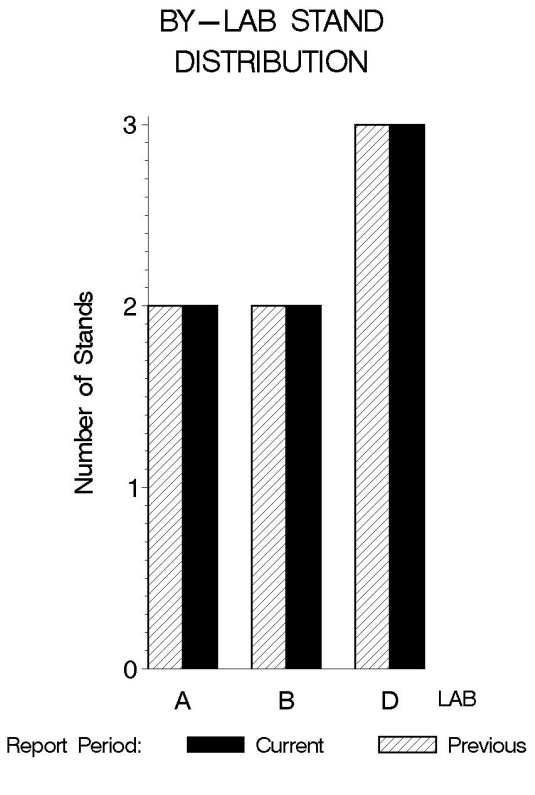
TO: Larry Hamilton, Chairman, L-60-1 Surveillance Panel

FROM: Scott Parke

SUBJECT: L-60-1 Testing from April 1, 1012 through September 30, 2012

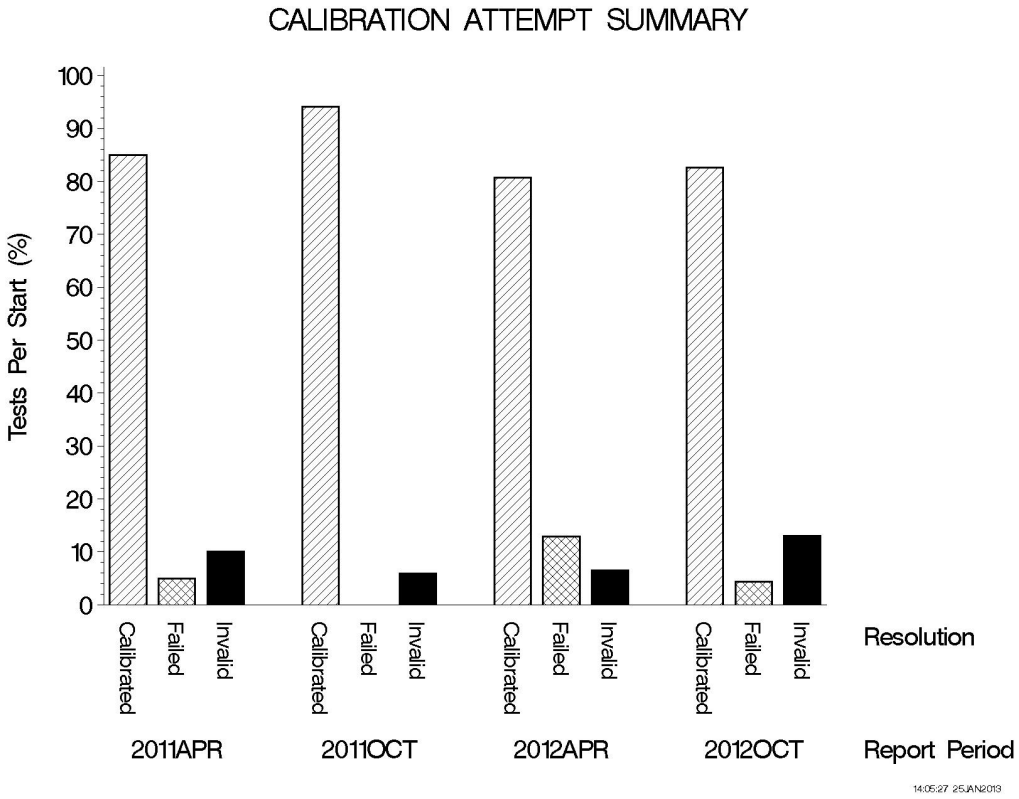
A total of 32 L-60-1 tests were reported to the Test Monitoring Center during the period from April 1, 1012 through September 30, 2012. Following is a summary of testing activity this period.

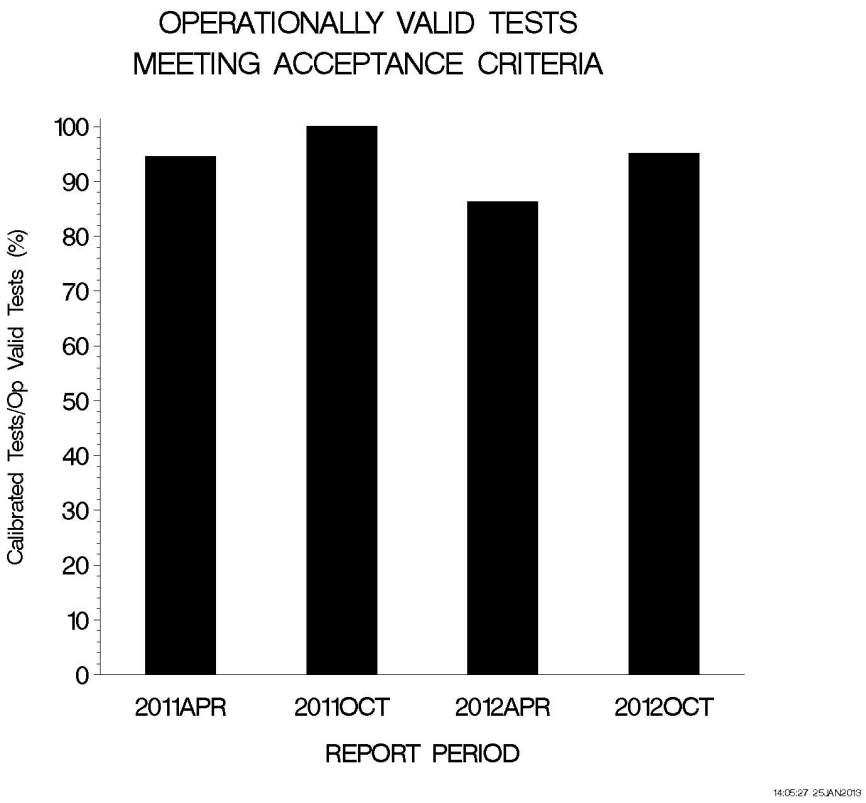
	Reporting Data	Calibrated on 9-30-12
Number of Labs	3	3
Number of Stands	7	7



Test Distribution by Oil and Validity

		148-1	151-2	Totals Last Period	Totals This Period
Accepted for calibration	AC	9	10	25	19
Rejected (Mild)	OC	0	0	0	0
Rejected (Severe)	OC	0	1	4	1
Rejected (Precision)	OC	0	0	0	0
Invalidated calibration	LC	0	3	0	3
Hardware approval	NI	2	7	9	9
Operationally invalid	RC	0	0	1	0
Aborted	XC	0	0	1	0
Total		11	21	40	32




OPERATIONALLY VALID TESTS
MEETING ACCEPTANCE CRITERIA
Calibrated Tests/Op Valid Tests (%)
100
90
80
70
60
50
40
30
20
10
0
2011APR
2011OCT
2012APR
2012OCT
REPORT PERIOD
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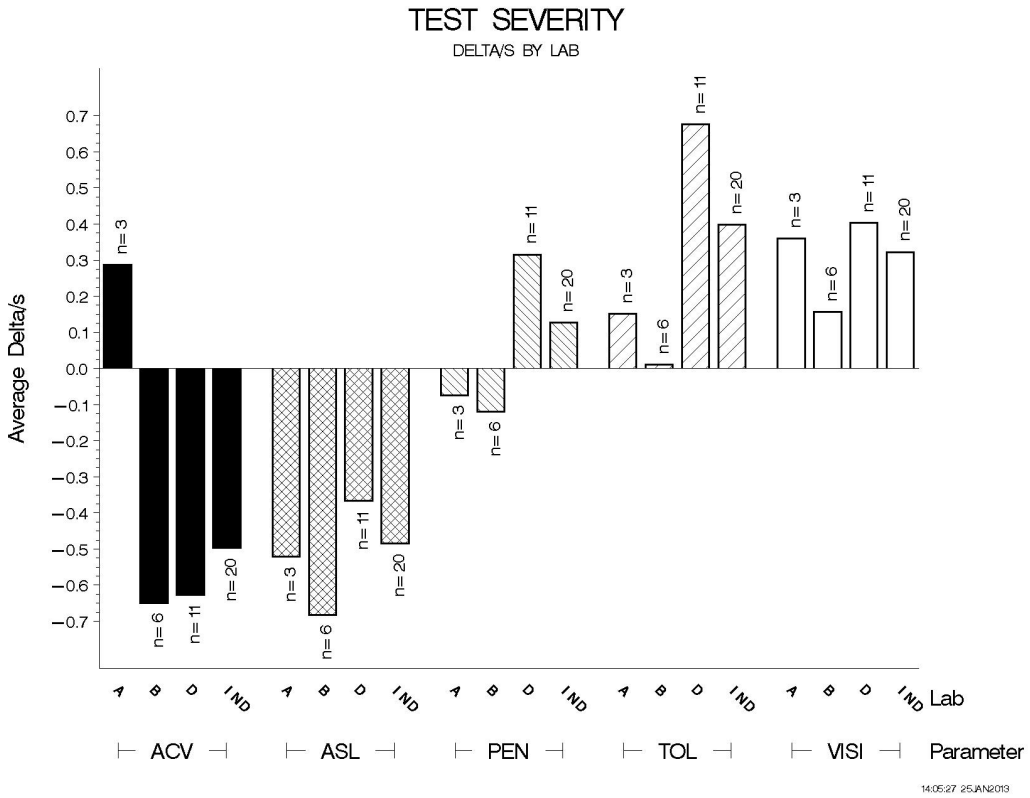
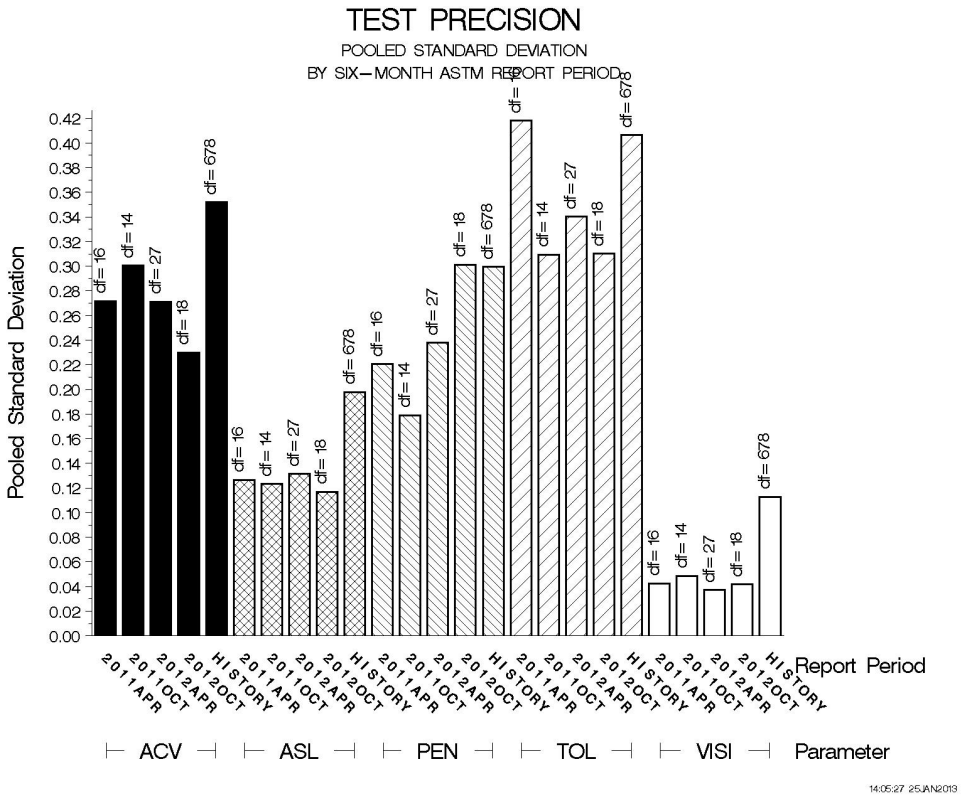
CAUSES FOR LOST TESTS:

			Oil		Validity			Loss Rate		
Lab	Cause		148-1	151-2	LC	RC	XC	Lost	Starts	%
B	Excess oil loss.			●	●			2	13	15%
	No airflow during warmup.			●	●					
D	Load not recorded following maintenance.			●	●			1	13	8%
		Lost	0	3	3	0	0			
		Starts	11	21	32	32	32			
		%	0%	14%	9%	0%	0%			

Average Δ/s by Lab						
LAB	n	VISI	PEN	TOL	ACV	ASL
A	3	0.360	-0.074	0.151	0.287	-0.522
B	6	0.157	-0.120	0.011	-0.649	-0.682
D	11	0.403	0.316	0.676	-0.628	-0.367
Industry	20	0.323	0.127	0.397	-0.497	-0.485
Shift*	20	2.614%	0.077%	0.289%	-0.432 merit	-0.048 merit

*computed using severity adjustment standard deviation





INDUSTRY CONTROL CHARTS:

The industry control charts are shown beginning on the following page.

All parameters continue to be more or less severe of target. Recent investigation as part of the new hardware introduction indicates that targets currently in use may not be representative of actual test performance. This was brought to the surveillance panel's attention during a May 9, 2012 meeting. They decided against making any target changes at that time. Precision for all parameters continues to be good.

L–60–1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL AVERAGE CARBON/ VARNISH

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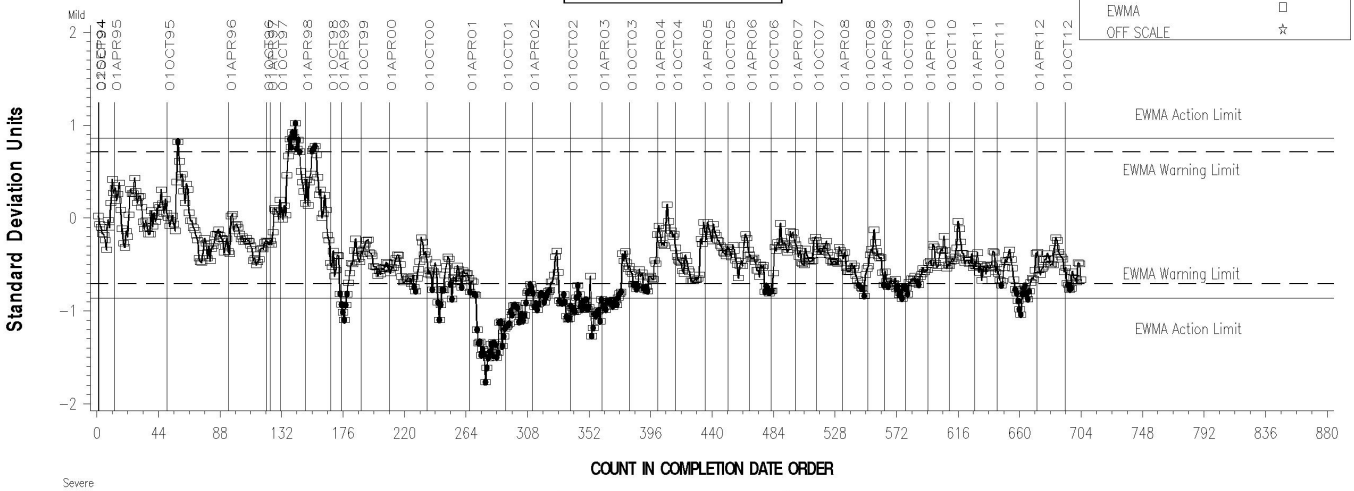
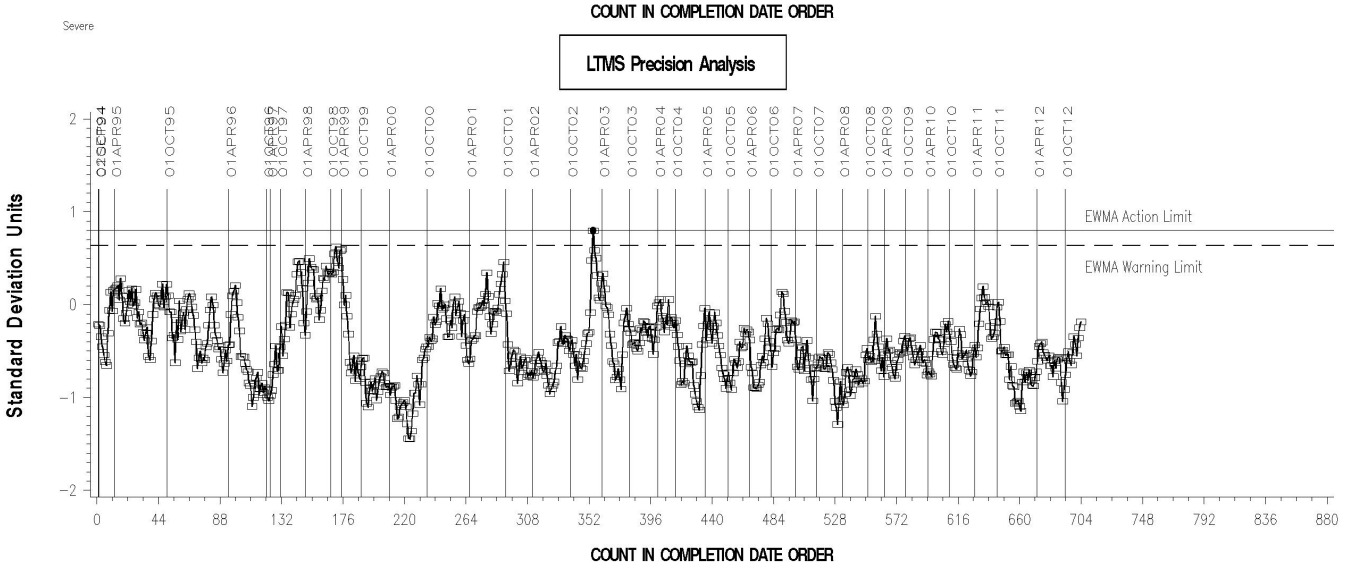
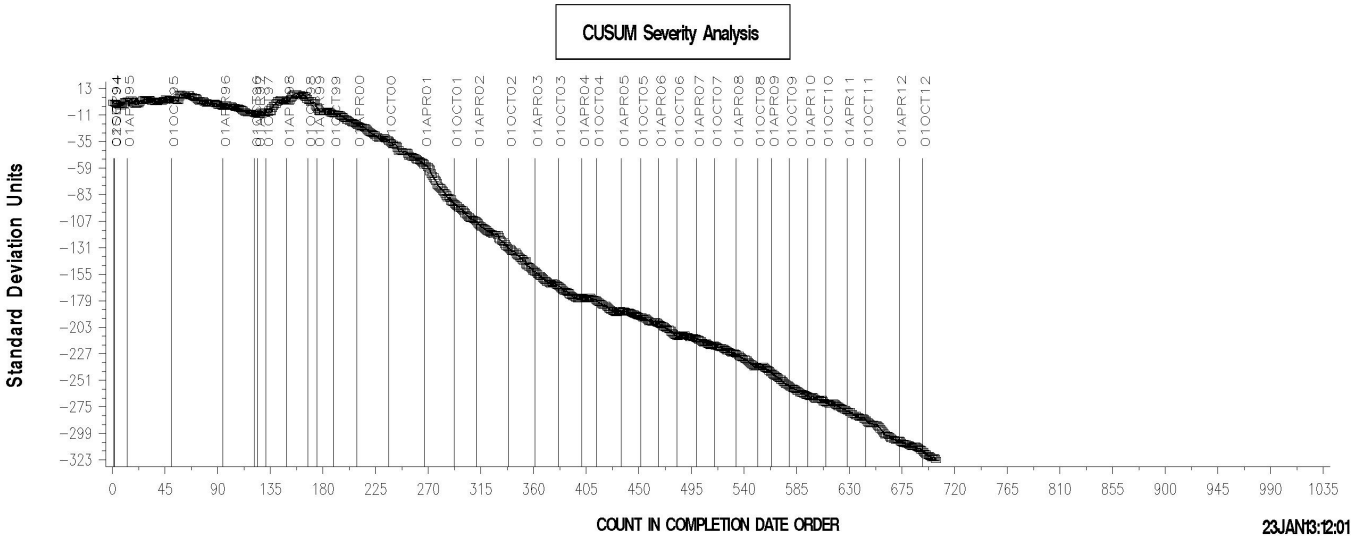
LTMS Severity Analysis



LTMS Precision Analysis



CUSUM Severity Analysis



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L-60-1 INDUSTRY OPERATIONALLY VALID DATA

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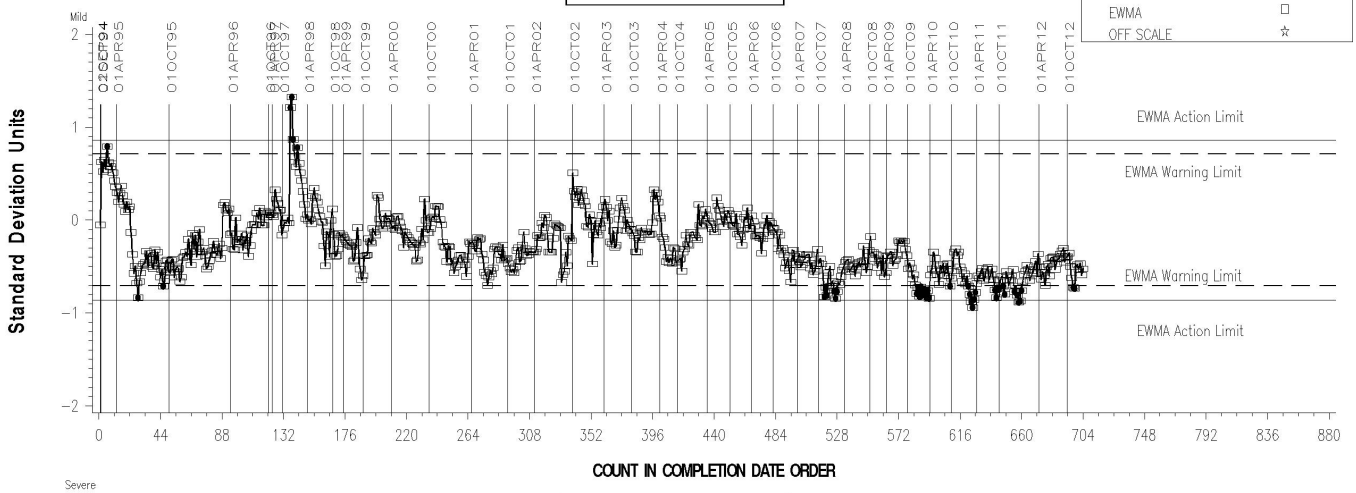
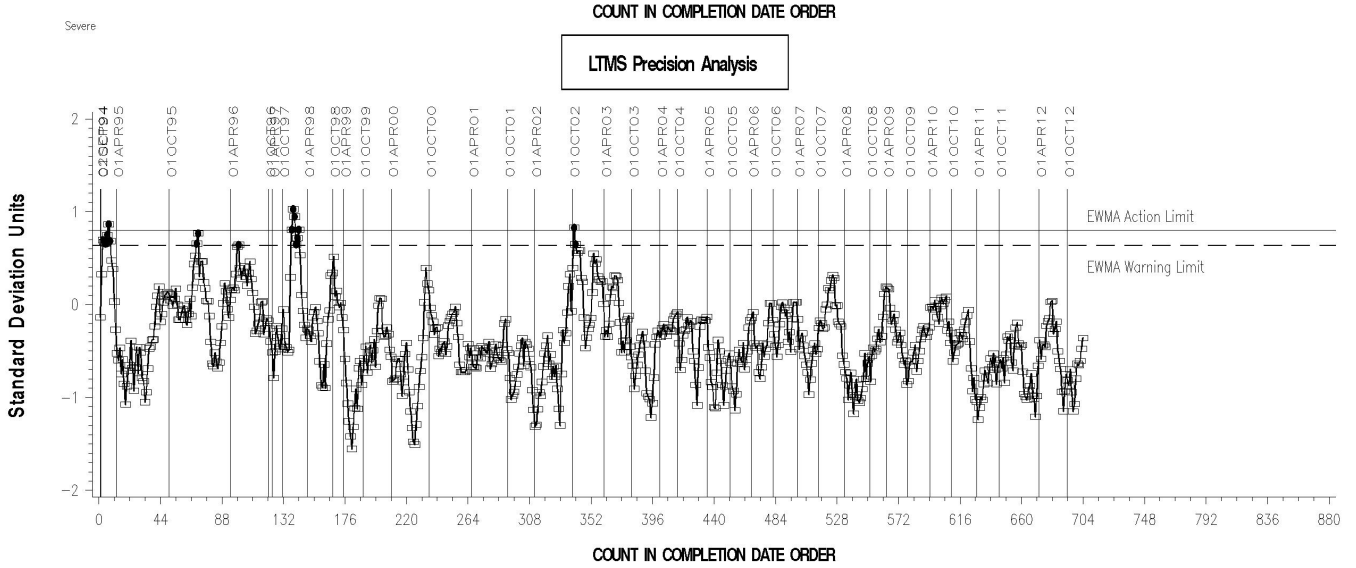
REF. FINAL AVERAGE SLUDGE

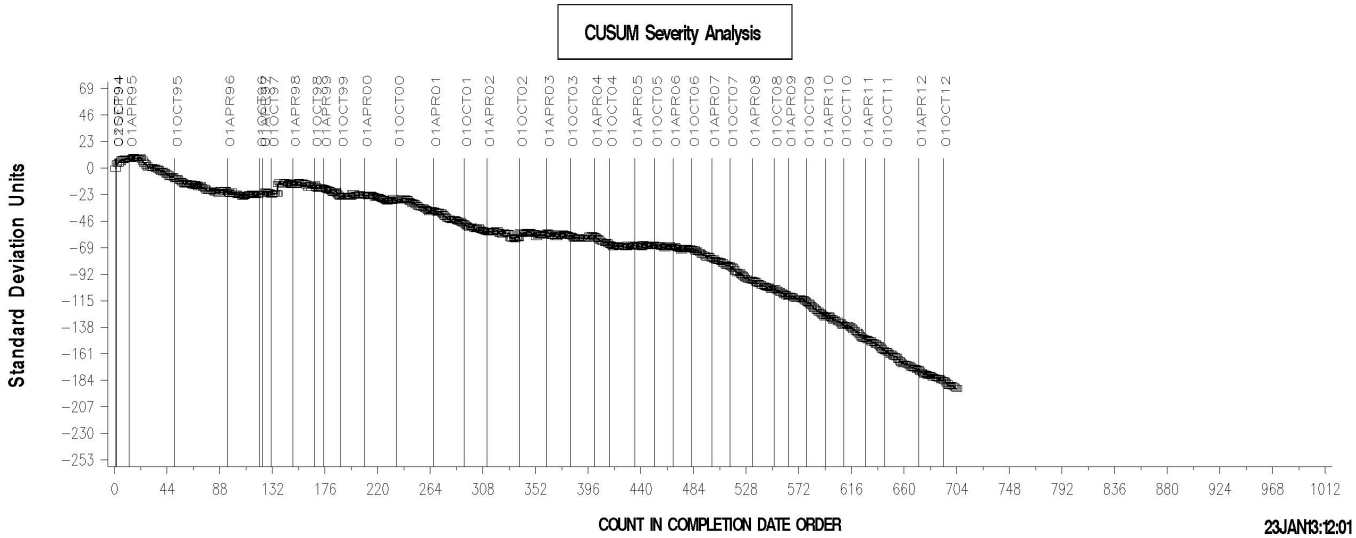
LTMS Severity Analysis



LTMS Precision Analysis



CUSUM Severity Analysis



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L-60-1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL PENTANE INSOLUBLES

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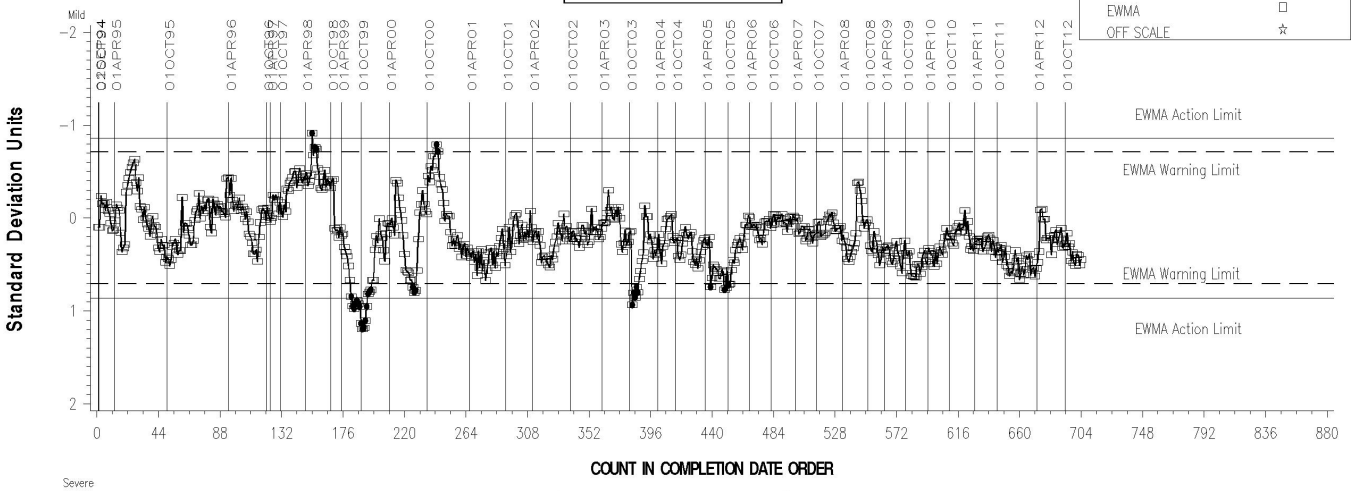
LTMS Severity Analysis



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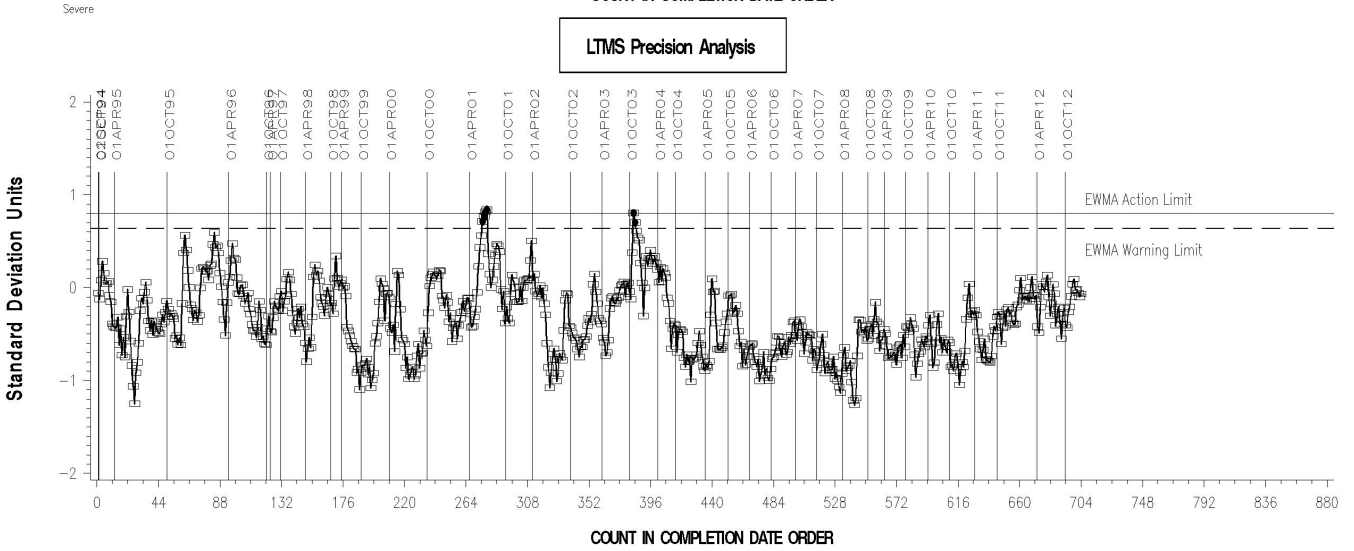
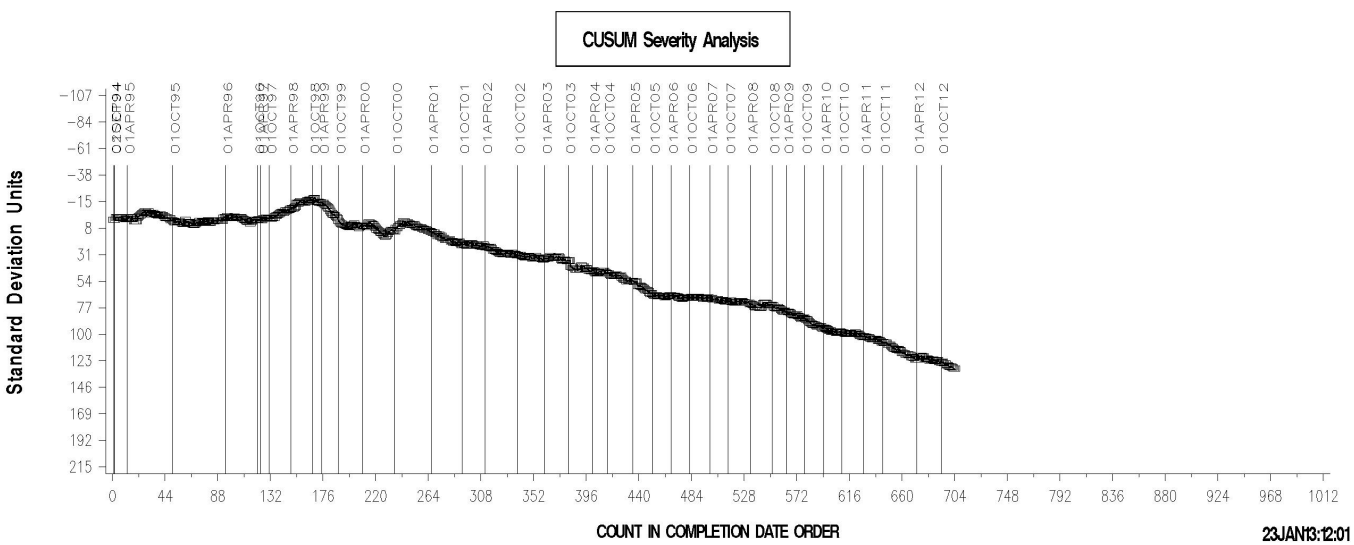


CUSUM Severity Analysis



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L–60–1 INDUSTRY OPERATIONALLY VALID DATA

REF. FINAL TOLUENE INSOLUBLES

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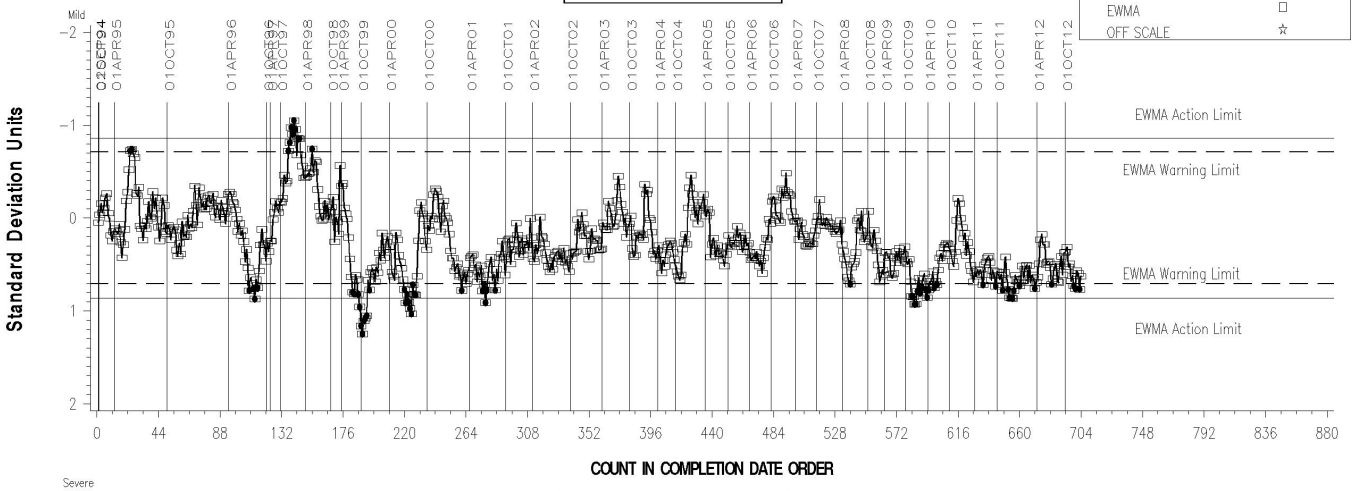
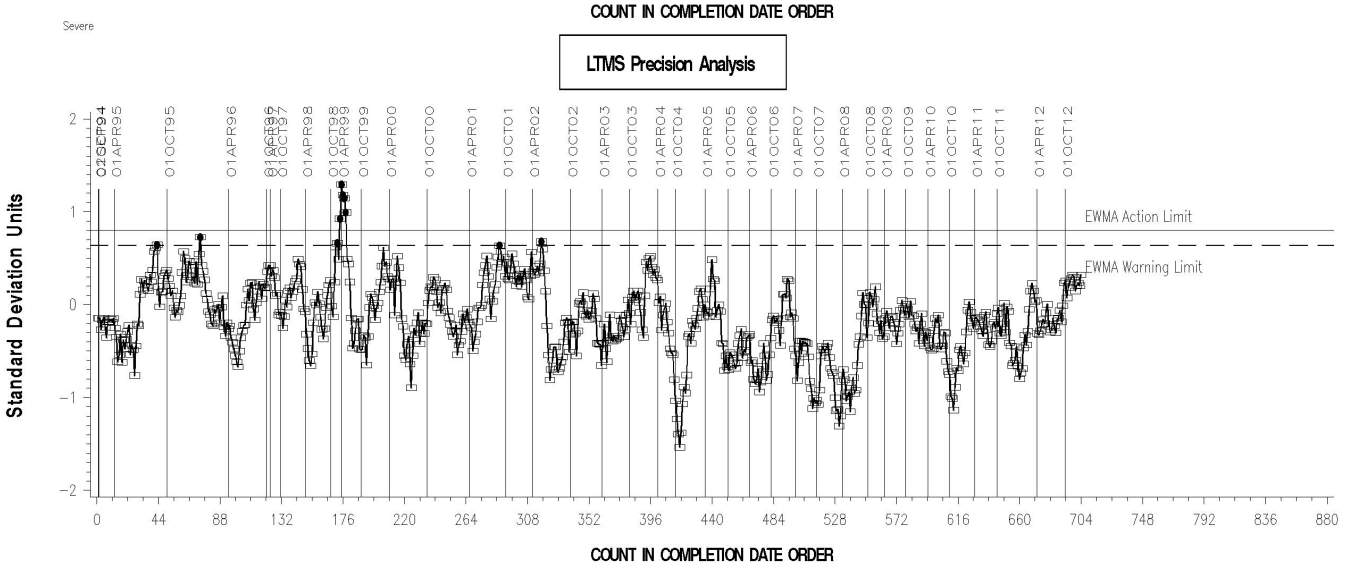
LTMS Severity Analysis



LTMS Precision Analysis



CUSUM Severity Analysis

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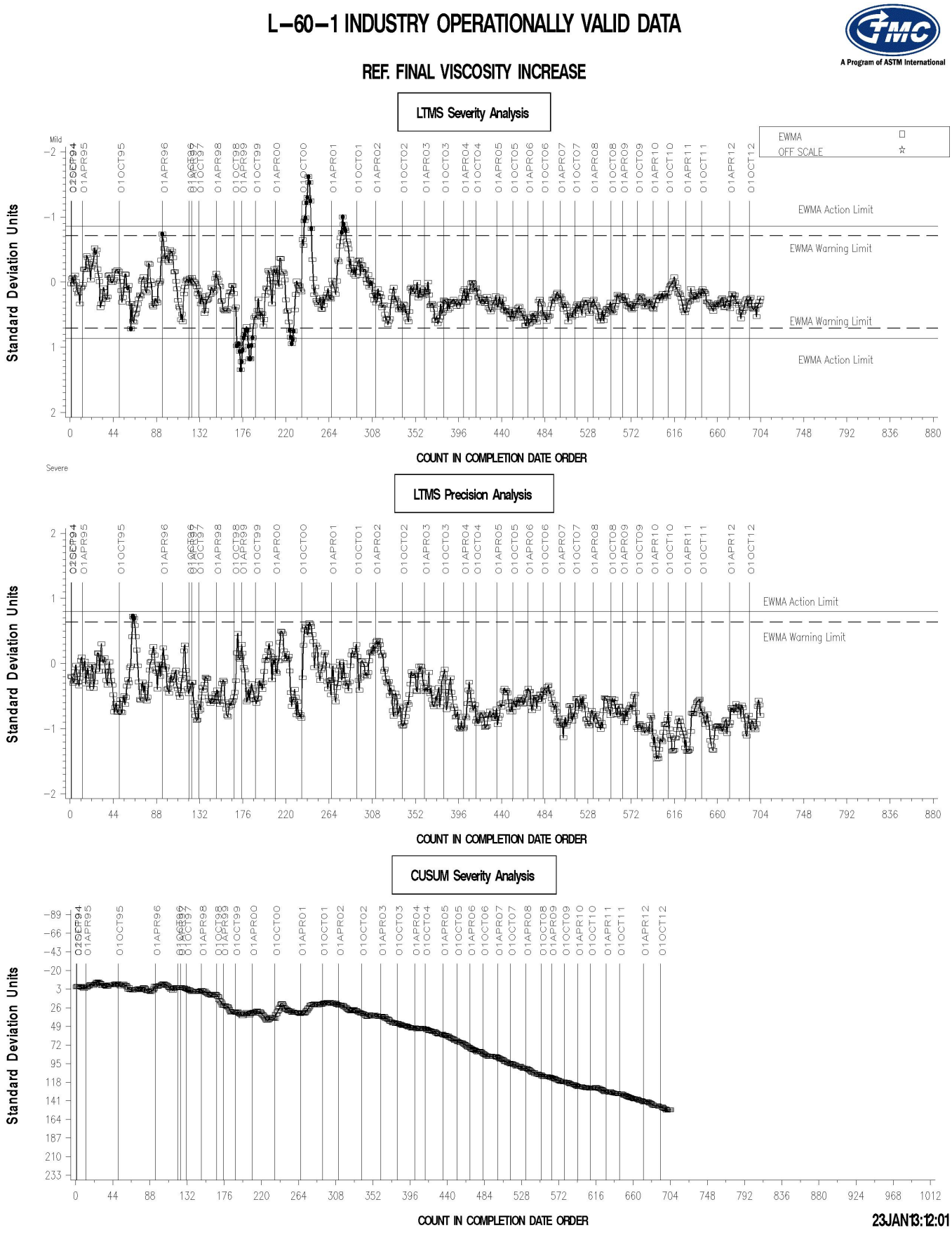
L–60–1 INDUSTRY OPERATIONALLY VALID DATA
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REF. FINAL VISCOSITY INCREASE
LTMS Severity Analysis
Mild
Severe
EWMA
OFF SCALE
EWMA Action Limit
EWMA Warning Limit
EWMA Warning Limit
EWMA Action Limit
Standard Deviation Units
COUNT IN COMPLETION DATE ORDER
LTMS Precision Analysis
EWMA Action Limit
EWMA Warning Limit
Standard Deviation Units
COUNT IN COMPLETION DATE ORDER
CUSUM Severity Analysis
Standard Deviation Units
COUNT IN COMPLETION DATE ORDER
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TIMELINE OF SIGNIFICANT EVENTS IN THE HISTORY OF THE L-60-1 TEST:

Effective Date	Information Letter	Event
19950901	95-1	Test Stand Motor Speed Change
19950901	95-1	Alternator Part Number Change
19950901	95-1	Air Box Heater Part Number Correction
19951026	95-2	Alternator Load Circuit Schemtic Addition
19951103	95-1	Report Forms and Dictionary Version 19950912
19951115	95-1	Transforms./Correction Factors
19960122	96-1	Severity Adjustment Calculation Method
19960430	96-2	TMC One Page Addition
19960430	96-2	TMC New Address
19960531	96-3	Perfect Seal Gasket Maker Use
19960531	96-3	Use of Modified Gear Case Housing
19960531	96-3	Report Forms and Dictionary Version 19960408
19970530	97-1	Revised Test Method Designation, Alternator Load Tolerance Revisions
19970530	97-1	Operational Validity Criteria, Zero Value Test Reporting
19970530	97-1	Report Forms and Data Dictionary, Test Reporting Clarifications(19970411)
19970530	97-1	Report Forms and Data Dictionary, Test Reporting Clarifications(19970411)
19970605	97-2	Air Flow Specification Revision and Air Supply Pressure Specification Removal
19971107	97-3	Revised Report Forms & Data Dictionary Version 19970902
19971107	97-3	Revised Precision & Bias Statement
19980612	98-1	Air Flow Calibration Requirement
19980623	98-2	Cleaning Agent Revision (Toluene)
19981123	98-3	Air Flow Calibration Requirement
19990100		Gear Problem (Manufacturer Changed Steel to Lead-Free Metallurgy)
19990101	98-3	Addition of CRC Gear Rating Workshop Training
19990215	99-1	Revised Gear Case Disassembly Procedure
19990301	99-2	Air Supply Line Note Addition
19990301	99-2	Data Logging Requirements
19990301	99-2	Strip Chart Requirements
19990301	99-2	Repeatability Term Change
19990609	99-3	Definition of Acceptable Gears for Testing Due to Severe Carbon Severity
19991016	99-4	Clarified test method for measuring Pentane and Toluene Insolubles
20000427		New Gear Batch 7-99 Introduced
20000427	00-1	Testing With Used Gears Discontinued
20020501	02-1	CRC Rating Manual 20
20020501	02-1	Report Forms and Data Dictionary
20020710	02-2	Test Gear Preparation
20020710	02-2	Shaft Oil Lip Seal
20020710	02-2	Speedi-Sleeve
20020710	02-2	Joint Radial Seal (V ring)
20020710	02-2	End of Test Oil Drain
20020710	02-2	Instrument Calibration Frequency
20021201	03-1	Revised end of test oil drain procedure
20021201	03-1	Pre-test gear preparation
20030205	03-2	Revised end of test oil drain procedure
20030430	03-2	Heater blower air output
20030430	03-3	Revised heater blower air output verification

Effective Date	Information Letter	Event
20030430	03-3	Digital manometer
20030506	03-3	Non-interpetable tests
20030506	03-3	Revisions to the use of warning statements
20030801	03-4	Revised heater blower air output verification
20030801	03-4	Preso low loss venturi meter and Dwyer digital manometer calibration
20040101	03-5	Cleaning solvent specification
20040401	04-1	Revised Gear Case Clening Procedure
20040401	04-1	Revised Carbon Depth Rating Guidelines
20040401	04-1	Editorial Changes to Precision Statement
20040630	04-2	Editorial Changes to Precision Statement
20040630	04-2	Air Flow Controller Calibration Standard Model Number Addition
20050225	05-1	Revised Solvent Specification
20050225	05-1	Carbon Varnish Rating Procedure
20050225	05-1	Donated Reference Oil Test Programs/Calibration period Length Adjustment
20050421	05-2	Updated Test Precision
20050421	05-2	Rounding Test Results Using ASTM E 29
20051010	05-3	Nitrile and Latex Gloves for Catalyst Handling
20060711	06-1	Revised Copper Catalyst Strip Cleaning Procedure
20060711	06-1	Editorial Revision
20061011	06-2	Phase Out of Manufacturer's Name and Updated Part Number for Lip Seal, Speedi-Sleeve Seal, and Joint Radial Seal.
20071115	07-1	Revised Downtime Wording
20090707	09-1	Revised Figure A2.1
20100510	10-1	Revised instrumentation calibration requirements and clarified validity of tests experiencing excessive oil loss.
20110426	11-1	Revision to gear sanding requirements.
20110912	11-2	Removal of requirement to mail paper final test report to TMC.
20120718	12-1	Corrected typo for Ogden heater part number
20120718	12-1	Allowed alternate primary heater part numbers
20120718	12-1	Allowed alternate alternator case number
20120904	12-2	Specified use of Remy 91751 alternator
20121107	12-3	Change to alternator pulley ratio specification

TMC LAB VISITS:
Two L-60-1 lab visits were conducted during this report period. These inspections discovered deficiencies in the procedure's specifications for the Chromolox heater, the Ogden heater, the alternator, and the low pressure manometer used for calibrating the oven airflow. Information letters have been issued to correct these findings or, in the case of the manometer, the lab switched to a different unit conforming to the procedure as written.

The revisions to D893 resulting from TMC inspections have all now been approved and incorporated into the current standard.

INFORMATION LETTERS:
Information Letter 12-1 was issued July 18, 2012. This information letter revised the permissible part numbers for the Chromolox heater, corrected a typographical error in the part number given for the Ogden heater, and permitted use of an alternator having an alternate case number.

Information Letter 12-2 was issued September 4, 2012. This information letter specified the use of a functionally and physically identical but more widely available alternator.

STATUS OF REFERENCE OIL SUPPLY:
At the end of this report period, the testing oil supply stood as outlined in the table below:

		@ TMC	
Oil	Cans @ Labs	Cans	Gallons
133	5	1693	105.8
148-1	23	547	34.2
151-2	21	60	3.8
Total	49	2300	143.8

A reblend of 151-2 (151-3) was acquired by TMC in 1999 but has since been consumed in other test types. That oil was then replaced by 155 which is also nearly depleted. A 155 reblend (155-1) is on hand at TMC and will be available for L-60-1 testing when the need arises. TMC inventory records indicate that 3.8 gallons of 151-2 remain. While this does provide oil for 60 tests, be advised that quantities that low can unexpectedly be depleted by even minor spills or transfer losses. The panel is advised to begin thinking about an introduction plan for 155-1. Five hundred and forty seven tests of oil 148-1 remain in TMC inventory; however, this is only 34.2 gallons. When the need arises, it will not be possible to obtain a reblend of this oil. The panel may also want to begin considering a possible replacement for this oil.

SDP/sdp/mem13-006.sdp.doc
cc: Frank Farber
Jeff Clark
ftp://ftp.astmtmc.cmu.edu/docs/gear/l601/semiannualreports/l601-10-2012.pdf

Distribution: email