



Test Monitoring Center

6555 Penn Avenue
Pittsburgh, PA 15206-4489
(412) 365-1000

MEMORANDUM: 07-036
DATE: June 1, 2007
TO: Jim Moritz, Chairman, Cummins Surveillance Panel
FROM: Jeff Clark
SUBJECT: ISM Calibration Testing for the April 2007 ASTM Report Period

The following is a summary of ISM reference oil tests completed during the April 2007 ASTM report period, which began on October 1, 2006 and ended on March 31, 2007.

Test Status	TMC Validity Code	Number of Tests
Acceptable Calibration Test	AC	1
Failed Calibration Test (LTMS Criteria)	OC	1
Operationally Invalid Test	LC	0
Aborted Test	XC	0
Total		2

The test that failed the LTMS Criteria was due to mild crosshead weight loss. This same test was also mild for injector adjusting screw weight loss, which is a non-critical parameter for reference tests.

Severity and Precision:

In general, the ISM is experiencing some large severity trends as explained in the paragraphs below. However, because reference testing volume remains extremely low, the impact of these trends might not truly be discerned.

Figure 1 (attached) shows the current industry EWMA severity, EWMA precision, and cusum charts for Crosshead Weight Loss (CWL). CWL is currently in an industry action alarm for severity, in the mild direction. For this period, CWL is trending an average of 2.11 Δ/s mild. Since the start of this mild trend, which dates back to January 2006, CWL is trending an average of 1.54 Δ/s mild, which is approximately 2.2 mg. This trend is potentially having a large impact on candidate testing as it represents almost 40% of the ISM Merit Anchor value of 5.7 mg. The surveillance panel is in the process of investigating this trend. As yet, no causes have been identified.

Figure 2 (attached) shows the current industry EWMA severity, EWMA precision, and cusum charts for Filter Plugging Delta P (FPD). FPD is currently within control chart limits. For this period, FPD is trending an average of 0.97 Δ/s severe, which is approximately 6 kPa at the ISM Merit Anchor value of 13 kPa.

Figure 3 (attached) shows the current industry EWMA severity, EWMA precision, and cusum charts for Average Sludge Rating (ASR). ASR is currently within control chart limits. For this period, ASR is trending an average of 1.07 Δ/s severe, which is approximately 0.16 merits.

Figure 4 (attached) shows the current industry EWMA severity, EWMA precision, and cusum charts for Injector Adjusting Screw Weight Loss (IAS). IAS is currently in an industry severity action alarm in the mild direction. For this period, IAS is trending an average of 1.54 Δ/s mild. Since the start of this mild trend, which dates back to July 2005, IAS is trending an average of 1.63 Δ/s mild, which is approximately 17.4 mg. This trend is potentially having a large impact on candidate testing as it represents 65% of the ISM Merit Anchor value of 27 mg. The surveillance panel is investigating the possible effects of screening injector adjusting screws for tooling marks. The use of these kits appears to correspond to the mild trend.

Precision estimates will be presented on an annual basis, in the table below. The precision estimate for 2005 has only two degrees of freedom which makes it difficult to compare to the other precision estimates. The precision estimates for 2006 show improvement compared to 2004, with the exception of ASR which shows comparable precision to 2004. The precision estimate for 2007 is a preliminary estimate based on testing to date.

ISM Precision Estimates

Parameter	2004	2005	2006	2007	2008
df	6	2	4	3	
CWL	1.4	0.5	0.7	2.1	
FPD (ln units)	0.4227	0.2561	0.1166	0.2748	
ASR	0.13	0.15	0.15	0.18	
IAS	7.0	5.0	5.4	3.4	

Reference Oils:

The current reference oil test targets are shown below:

Oils	N	Parameter	Mean (cSt)	S
830-2	10	CWL	5.3	1.4
		FPD	2.3363	0.4130
		ASR	8.99	0.15
		IAS	24.5	10.7

To date, 19 tests have been run on oil 830-2.

Information Letters:

ISM Information Letter 07-1, Sequence No. 1, was issued February 8, 2007. Topics covered included using the DACA II report to specify accuracy and precision of operational measurement systems, including non-interpretable tests in the calibration period test count, and removing D 129 from the list of substitute fuel sulfur measurements.

TMC Laboratory Visits:

One TMC laboratory visit was conducted this ASTM period. One deficiency was noted. The external oil system port was not properly located on the oil pan.

Additional Information:

The ISM timeline is attached as Figure 5. The ISM database and alarm logs can be accessed on the TMC's homepage. If you have any questions on how to access this information, contact the TMC.

JAC/jac/mem07-036.jac.doc

Attachments

c: J.L. Zalar, TMC
F.M. Farber, TMC
Cummins Surveillance Panel
<ftp://ftp.astmtmc.cmu.edu/docs/diesel/cummins/semiannualreports/ISM/ISM-04-2007.pdf>

Distribution: Email

FIGURE 1
ISM INDUSTRY OPERATIONALLY VALID DATA
CROSSHEAD WEIGHT LOSS ADJUSTED TO 3.9 % SOOT

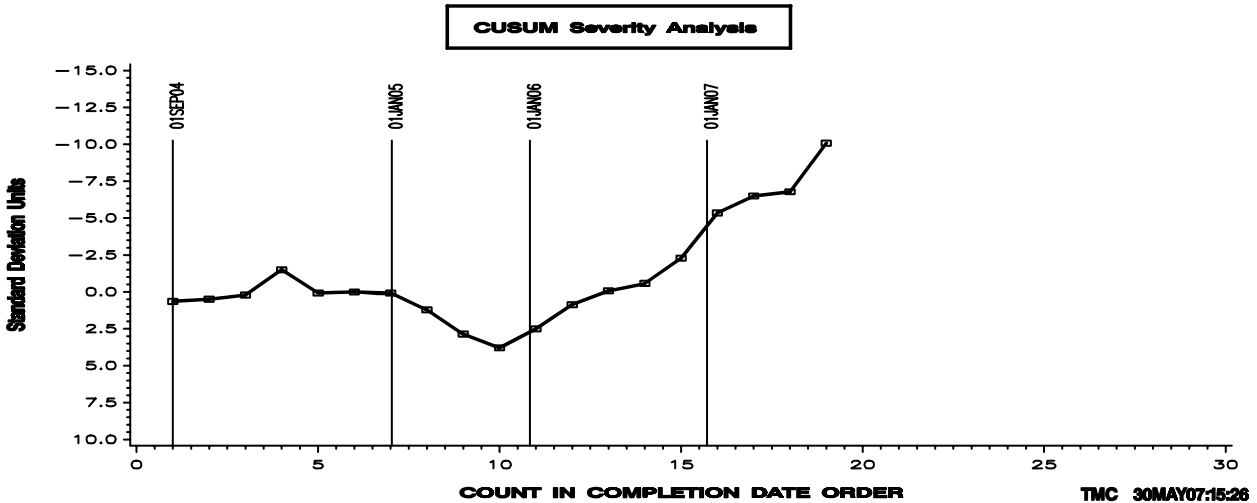
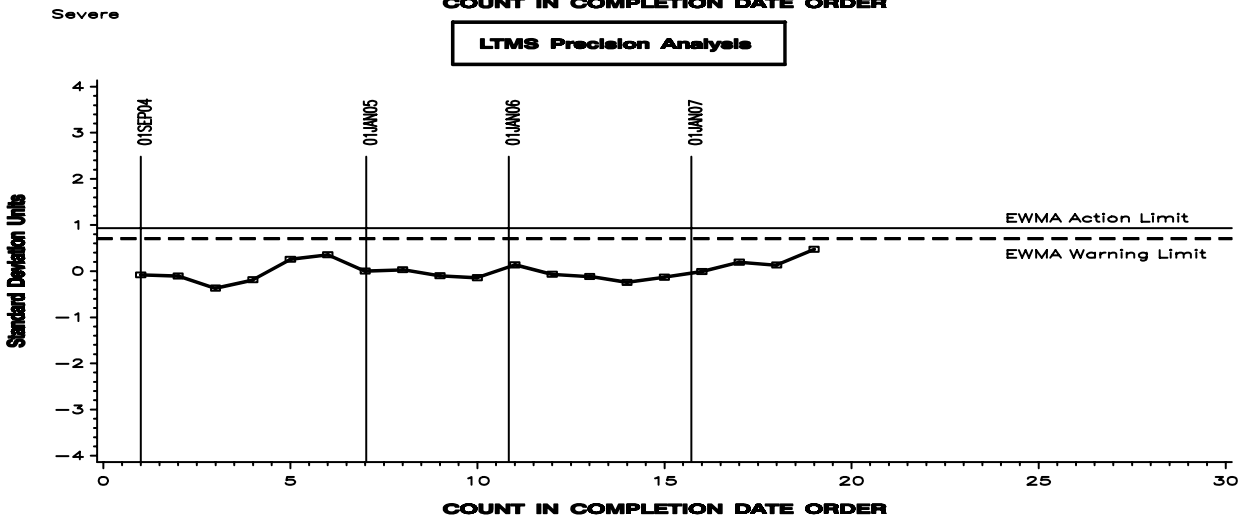
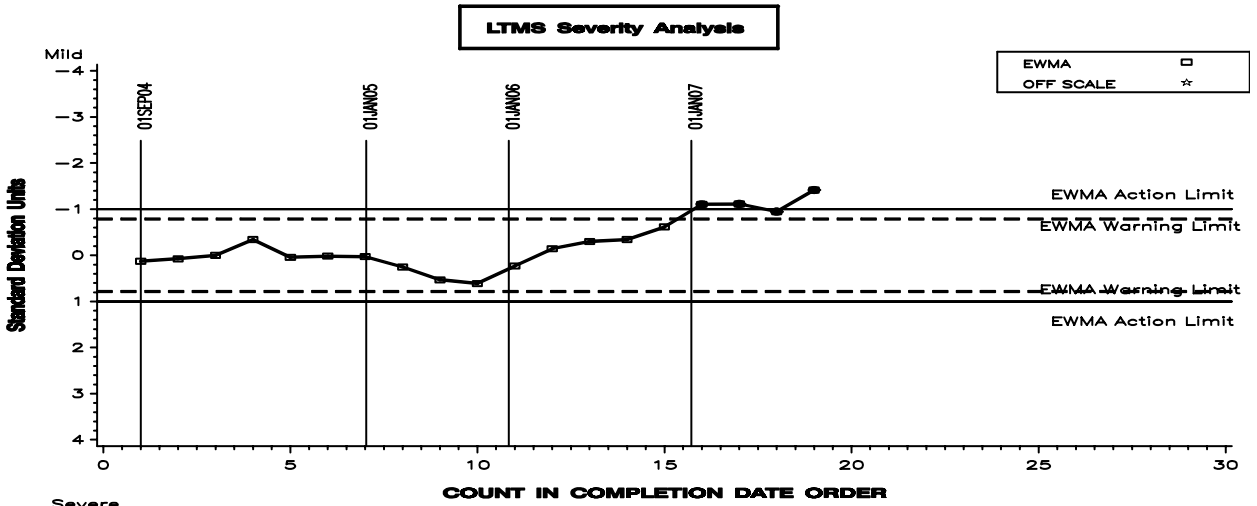


FIGURE 2
ISM INDUSTRY OPERATIONALLY VALID DATA

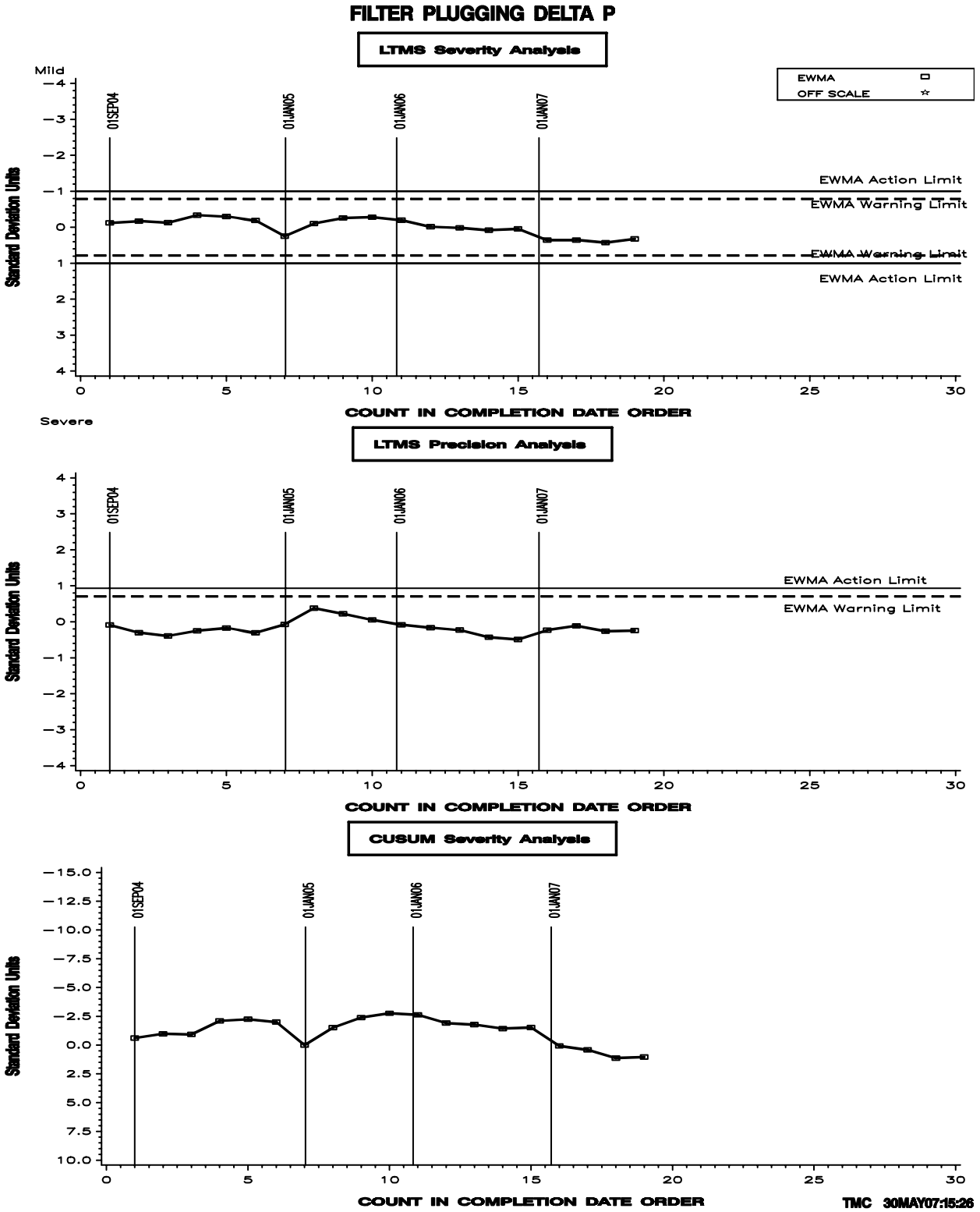


FIGURE 3
ISM INDUSTRY OPERATIONALLY VALID DATA

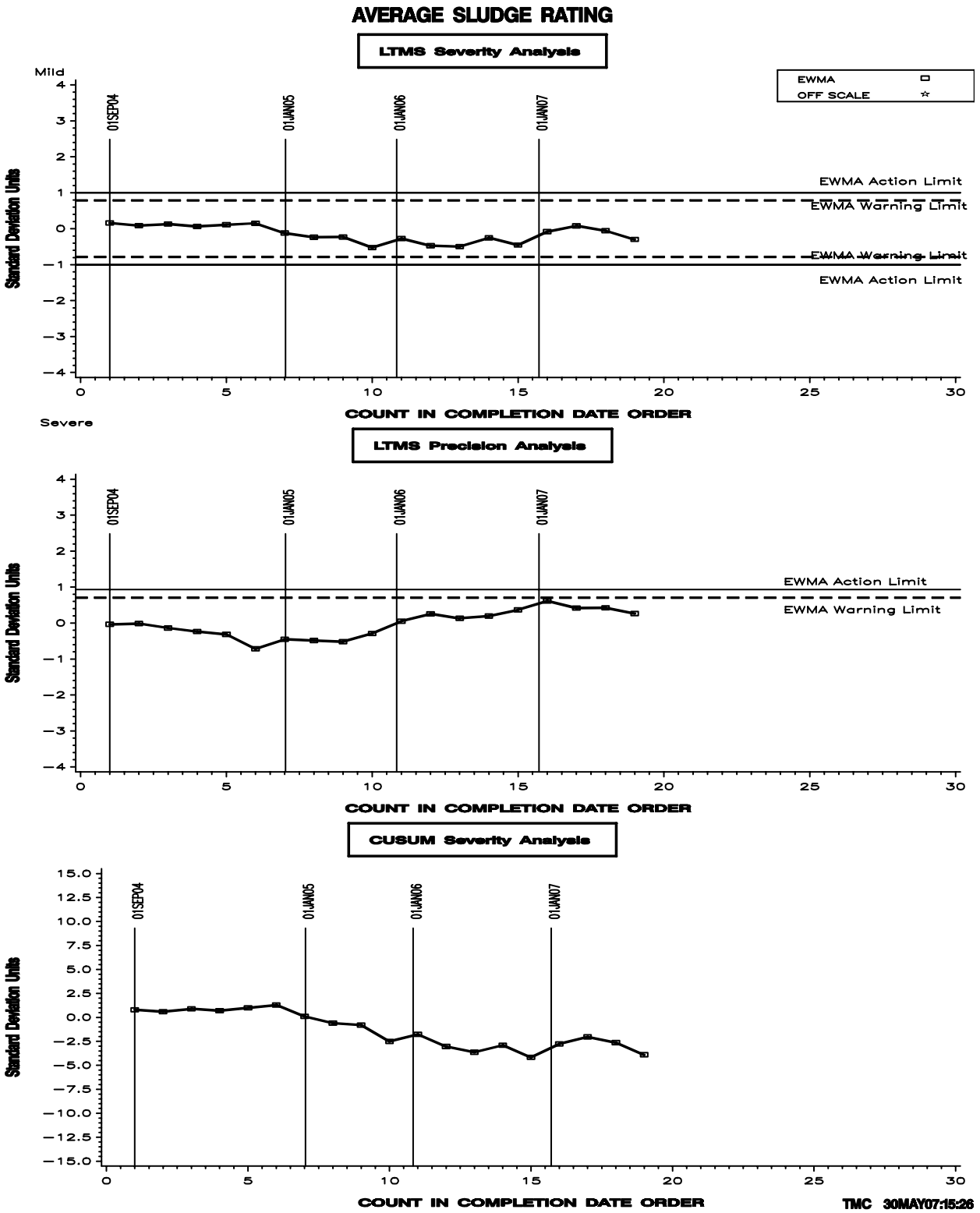


FIGURE 4

ISM INDUSTRY OPERATIONALLY VALID DATA

INJECTOR SCREW WEIGHT LOSS ADJUSTED TO 3.9% SOOT

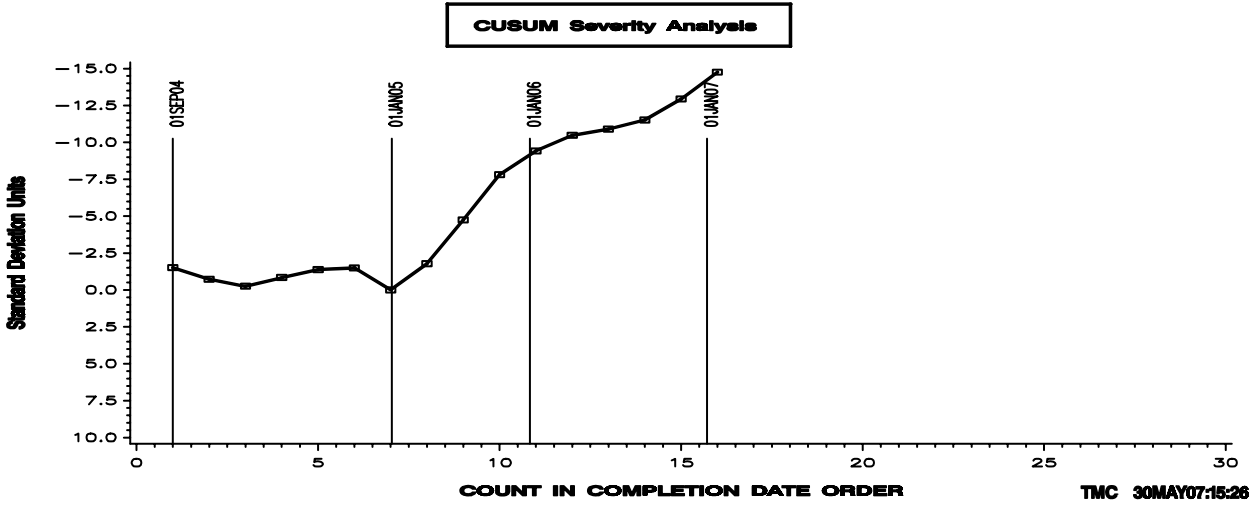
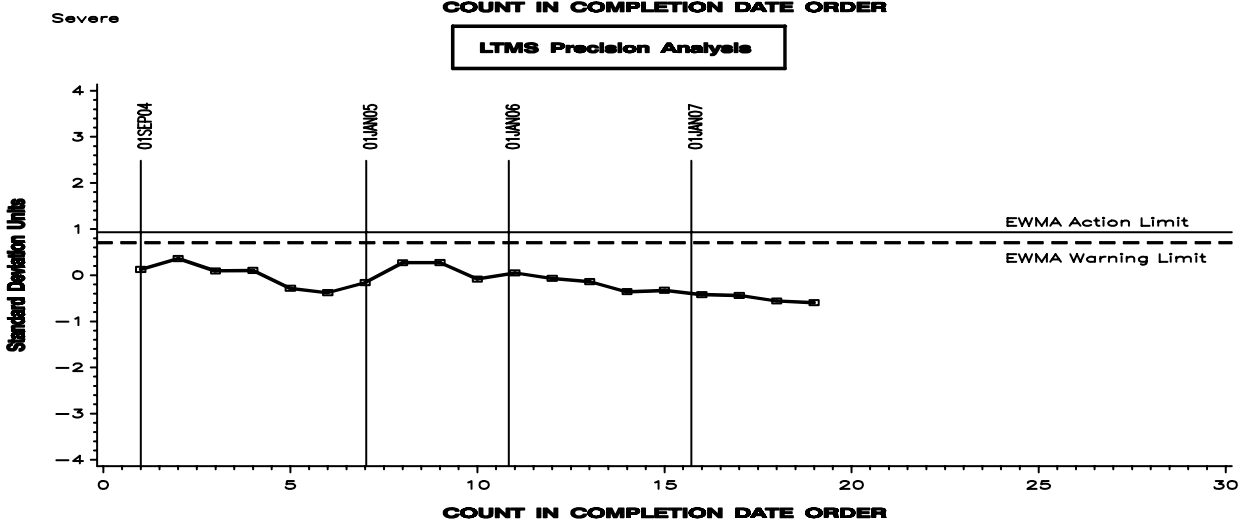
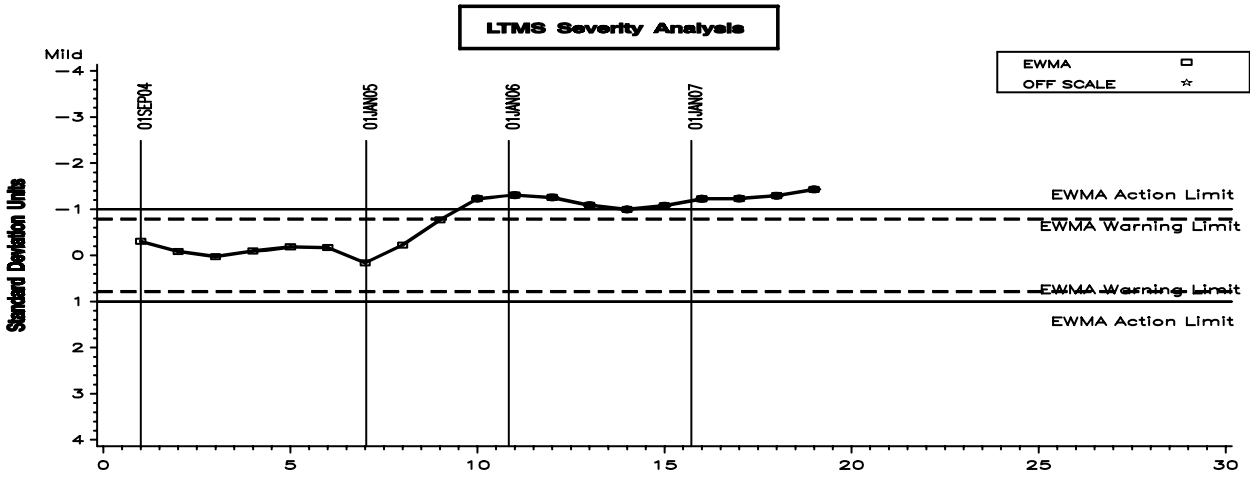


FIGURE 5

ISM Timeline

15:27 Wednesday, May 30, 2007 1

Obs	effective_date	info_letter_number	event
1	20040324		BEGINNING OF DEVELOPMENT AND DISCRIMINATION MINI-MATRIX
2	20050217		DECISION TO SCREEN INJECTOR ADJUSTING SCREWS FOR TOOLING MARKS.
3	20050322		COMPLETION OF MINI-MATRIX ANALYSIS AND IMPLEMENTATION OF SOOT ADJUSTMENTS FOR WEAR PARAMETERS
4	20050328		LTMS IMPLEMENTED
5	20051201		TEN-TEST TARGETS IMPLEMENTED FOR OIL 830-2
6	20070130	07-1	DRAFT 10 OF THE TEST PROCEDURE RELEASED.
7	20070208	07-1	DACA II REPORT USED FOR OPERATIONAL MEASUREMENT ACCURACY & PRECISION
8	20070208	07-1	D 129 REMOVED FROM LIST OF FUEL SULFUR MEASUREMENTS.
9	20070208	07-1	NON-INTERPRETABLE TESTS INCLUDED IN CALIBRATION PERIOD TEST COUNT.
10	20070402	07-2	CALIBRATION PERIOD SET AT 12 MONTHS OR 12 TESTS.