



Test Monitoring Center

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MEMORANDUM: 07-063
DATE: October 23, 2007
TO: Jim Moritz, Chairman, Cummins Surveillance Panel
FROM: Jeff Clark
SUBJECT: ISM Calibration Testing for the October 2007 ASTM Report Period

The following is a summary of ISM reference oil tests completed during the October 2007 ASTM report period, which began on April 1, 2007 and ended on September 30, 2007.

Test Status	TMC Validity Code	Number of Tests
Acceptable Calibration Test	AC	7
Failed Calibration Test (LTMS Criteria)	OC	1
Operationally Invalid Test	LC	1
Non-blind, Information	NN	1
Total		10

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:

Figure 1 (attached) shows the current industry EWMA severity, EWMA precision, and cusum charts for Crosshead Weight Loss (CWL). CWL is within control chart limits. For this period, CWL is on target.

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 averaged 0.19 Δ/s severe, which is approximately 2 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 on target.

Figure 4 (attached) shows the current industry EWMA severity, EWMA precision, and cusum charts for Injector Adjusting Screw Weight Loss (IAS). IAS is currently within control chart limits. For this period, IAS is on target.

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	7	
CWL	1.4	0.5	0.7	1.9	
FPD (ln units)	0.4227	0.2561	0.1166	0.3736	
ASR	0.13	0.15	0.15	0.13	
IAS	7.0	5.0	5.4	4.0	

Reference Oils:

The current reference oil test targets are shown below:

Oils	N	Parameter	Mean (cSt)	S
830-2	21	CWL	5.1	1.5
		FPD	2.5209	0.3274
		ASR	9.0	0.15
		IAS	29.5	5.7

To date, 25 tests have been run on oil 830-2. The TMC will advise the panel of a potential test target update once 30 tests have been completed. The table below shows supply levels of oil 830-2.

Oils	TMC Inventory (gallons)	Lab Inventory (# of samples)	Estimated Life (years)
830-2	1941	10	4.8

Information Letters:

ISM Information Letter 07-2, Sequence No. 2, was issued April 2, 2007. This information letter set the calibration period to 12 months or 12 tests. ISM Information Letter 07-3, Sequence No. 3, was issued August 8, 2007. Topics covered included correction factors for Crosshead Weight Loss and Injector Adjusting Screw Weight loss, as well as the addition of the ISM Merit Calculation method.

TMC Laboratory Visits:

One TMC laboratory visit was conducted this ASTM period. Three deficiencies were noted: the use of non-specified engine coolant; coolant pressure not being maintained within specification; and non-specified blaster media being used for post test ring cleaning.

Quality Index:

One Quality Index deviation was issued this ASTM period for fuel flow. A single data reading was taken during an ECM initiated de-rate condition, which cause the negative QI value.

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/mem07-063.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-10-2007.pdf>

Distribution: Email

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

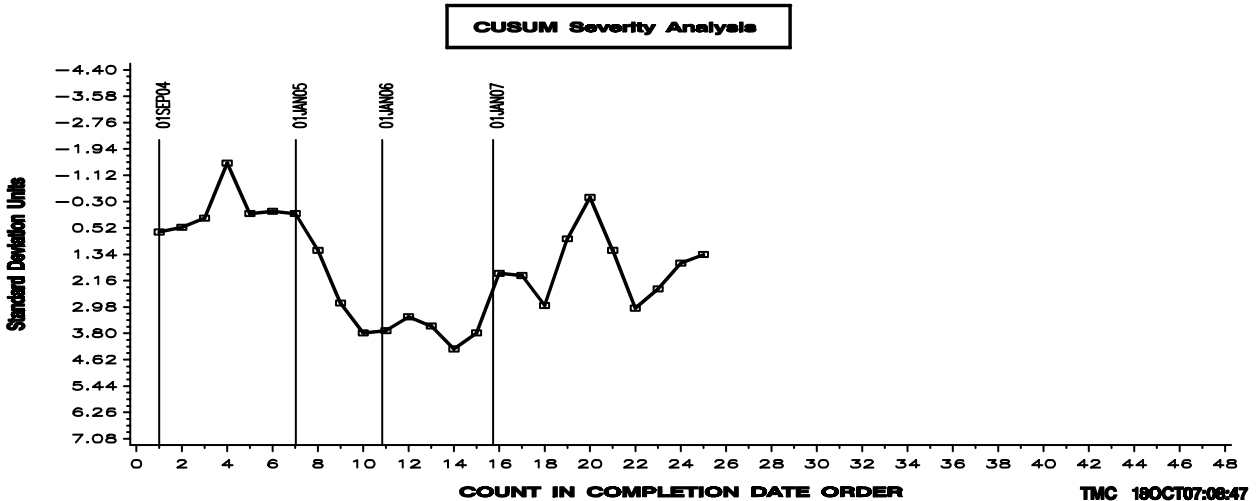
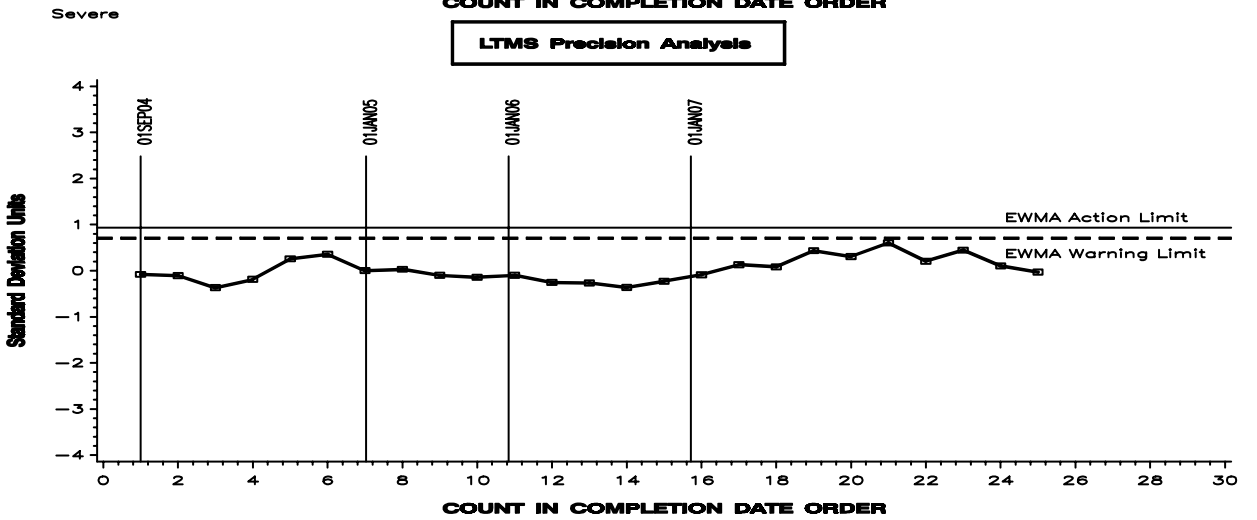
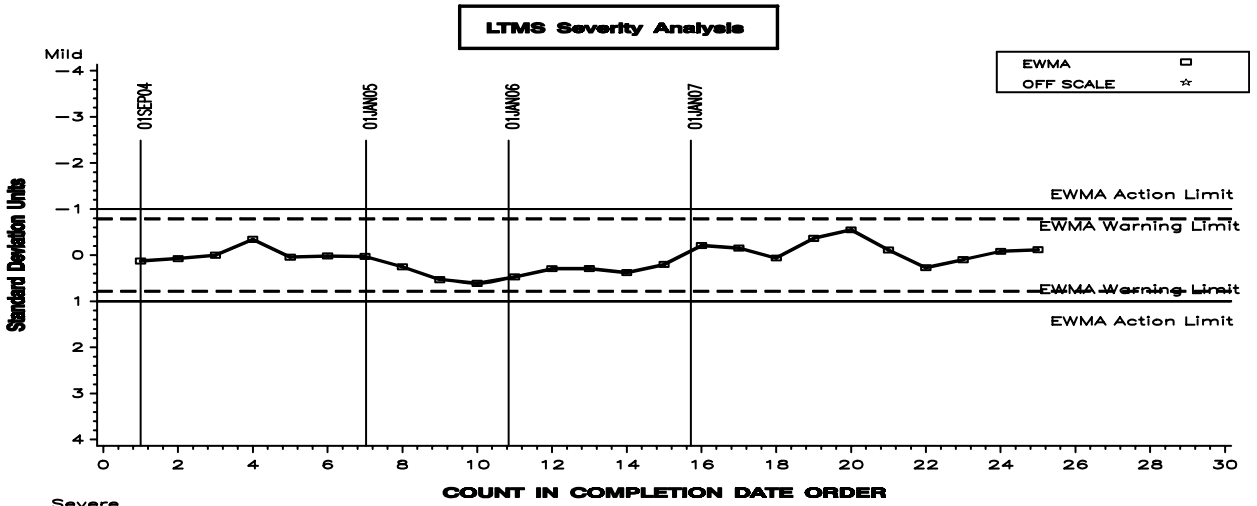


FIGURE 2
ISM INDUSTRY OPERATIONALLY VALID DATA

FILTER PLUGGING DELTA P

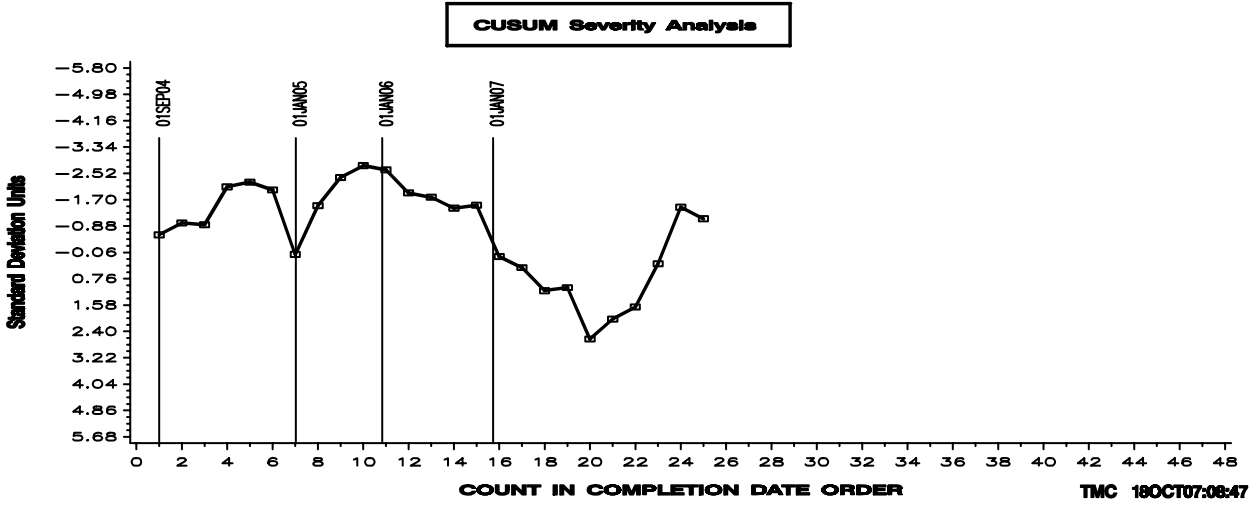
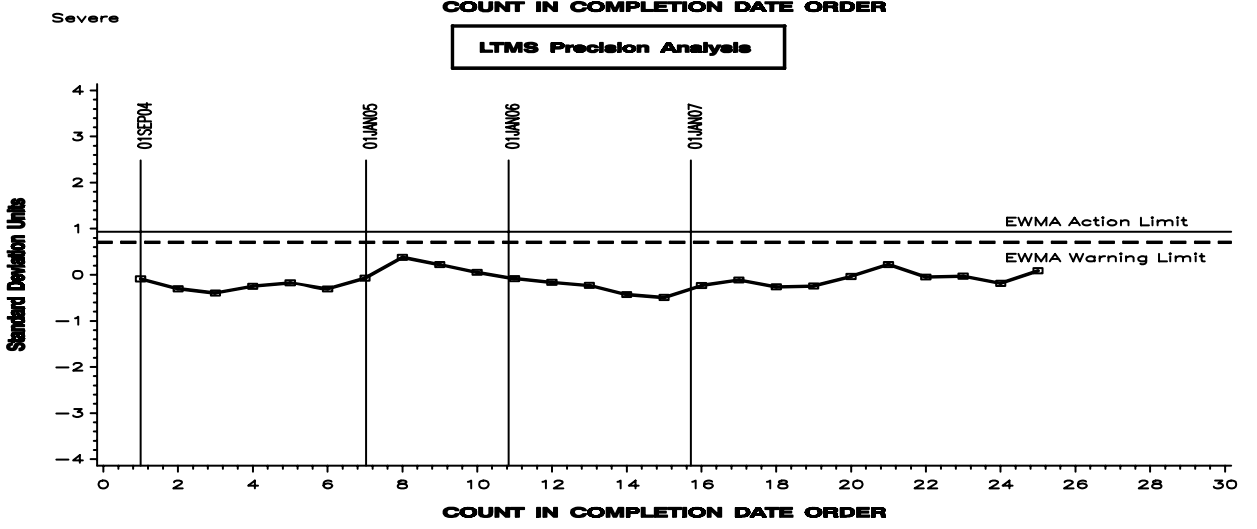
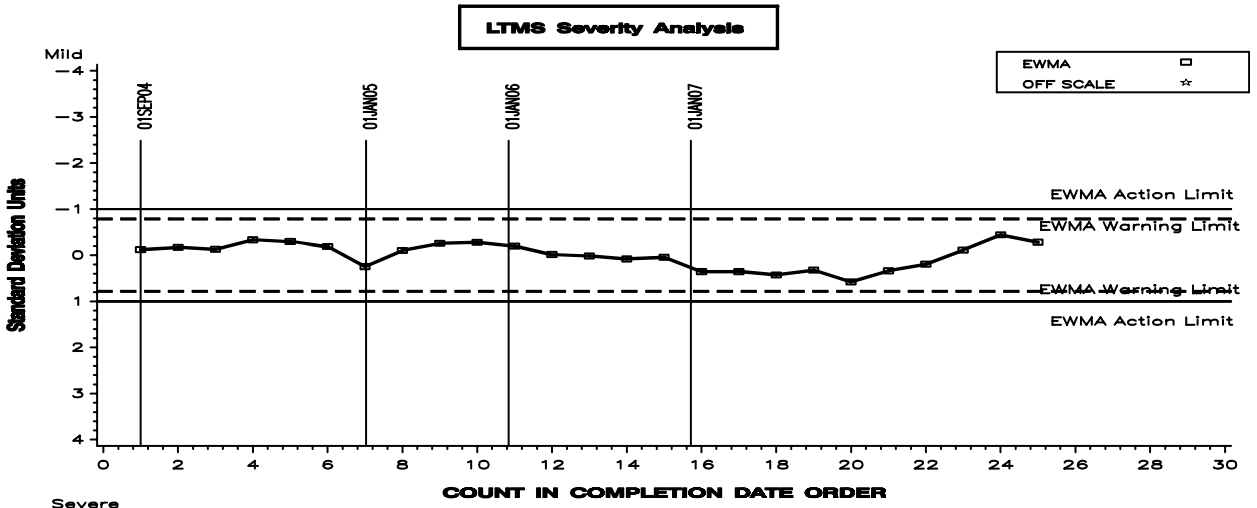


FIGURE 3
ISM INDUSTRY OPERATIONALLY VALID DATA

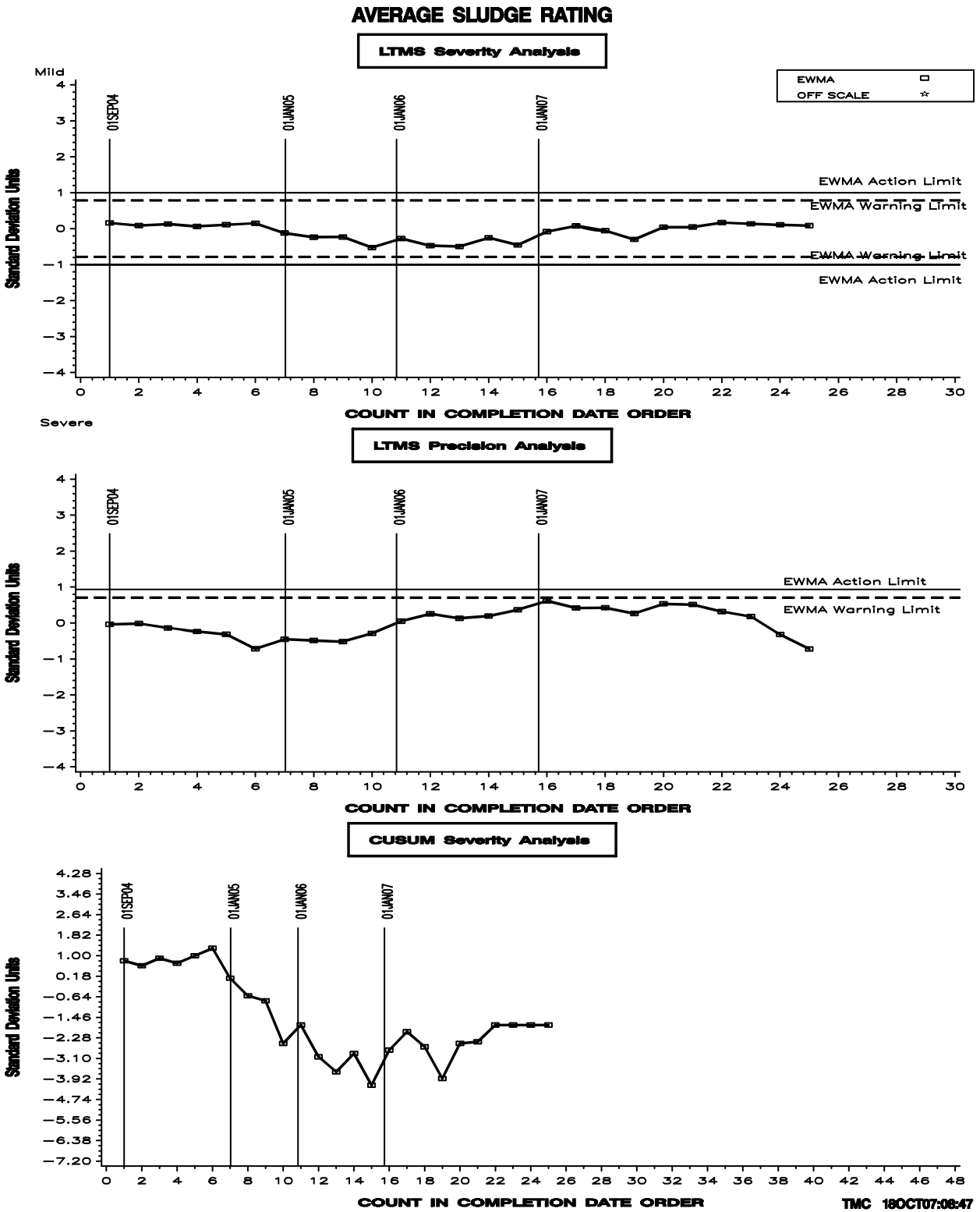


FIGURE 4

ISM INDUSTRY OPERATIONALLY VALID DATA

INJECTOR SCREW WEIGHT LOSS ADJUSTED TO 3.9% SOOT

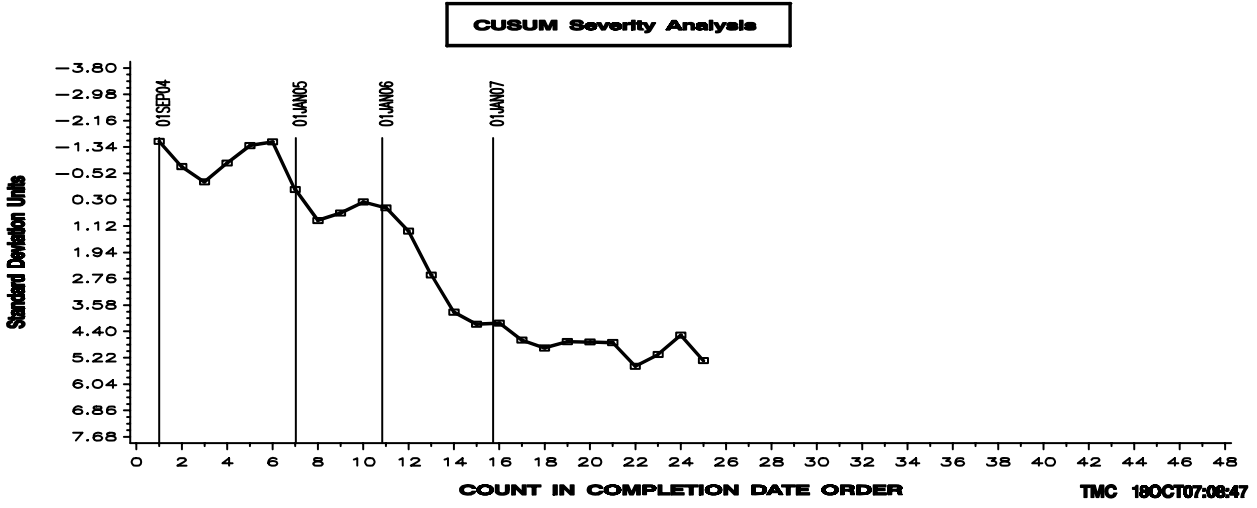
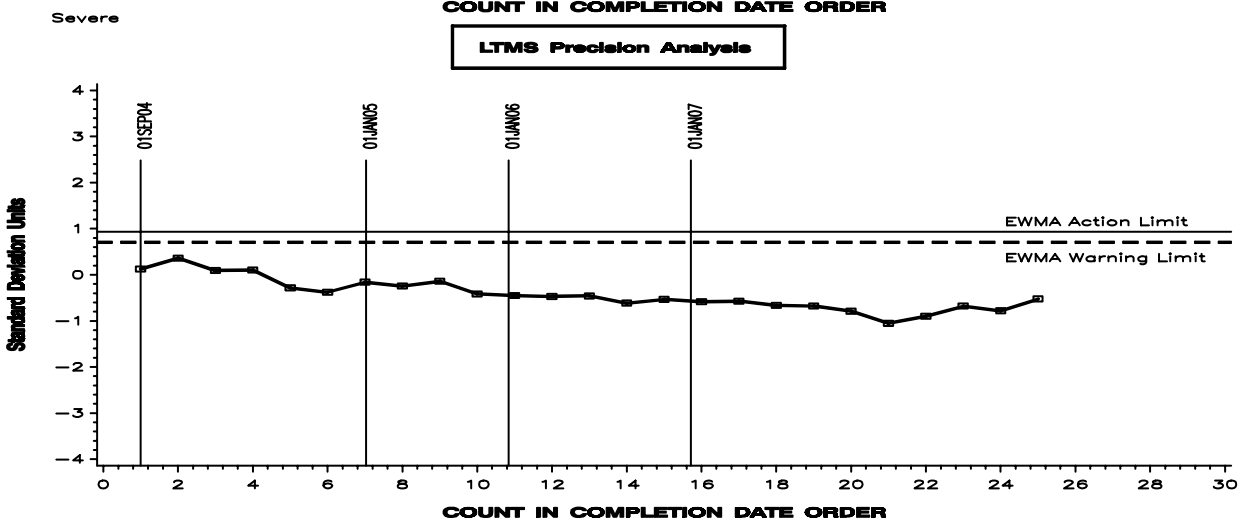
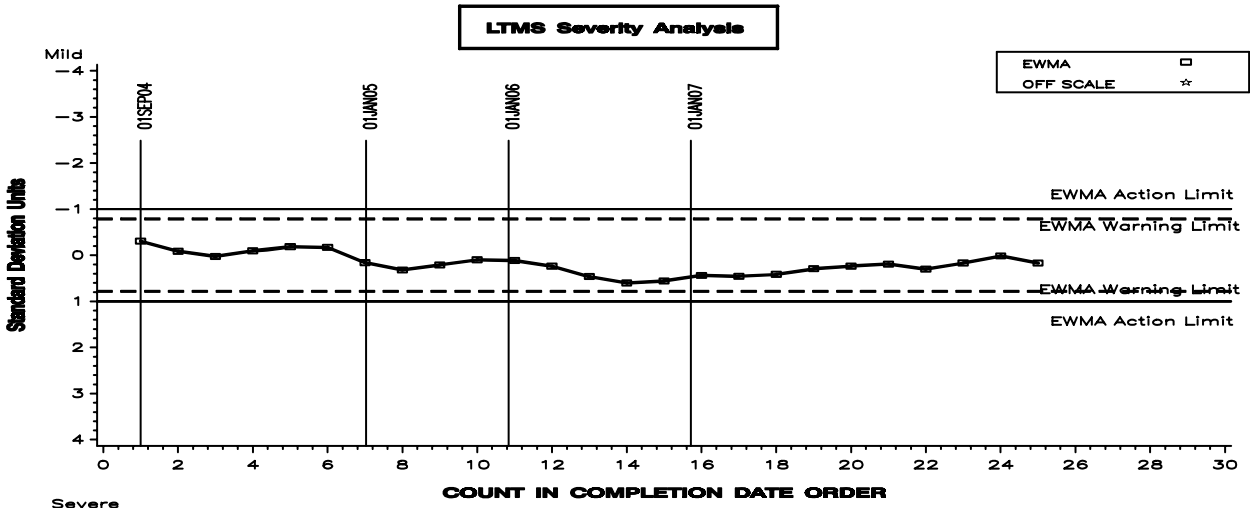


FIGURE 5

ISM Timeline

07:38 Wednesday, October 17, 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.
11	20070628		Industry correction factor of +19.1 mg implemented for Injector Adjusting Screw weight loss.
12	20070628		Industry correction factor of +1.7 mg implemented for Crosshead weight loss.
13	20070807		TWENTY-ONE TEST TARGETS IMPLEMENTED FOR OIL 830-2