



Test Monitoring Center

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MEMORANDUM: 08-021
DATE: April 17, 2008
TO: Mark Cooper, Chairman, Mack Test Surveillance Panel
FROM: Jeff Clark
SUBJECT: T-12 Calibration Testing for the April 2008 ASTM Report Period

The following is a summary of T-12 reference oil tests completed during the April 2008 ASTM report period, which began on October 1, 2007 and ended on March 31, 2008.

Test Status	TMC Validity Code	Number of Tests
Acceptable Calibration Test	AC	4
Failed Calibration Test (LTMS Criteria)	OC	1
Operationally Invalid Test	LC	0
Aborted Test	XC	0
Total		5

One test failed due to mild Delta PB at EOT.

Severity and Precision:

Figure 1 (attached) shows the current industry EWMA severity, EWMA precision, and cusum charts for Delta PB at EOT (PB). PB is currently within control chart limits. However, for this period, PB is trending an average of 0.59 Δ/s mild. This is equivalent to 0.143 natural log units or approximately 3.3 ppm at the CJ-4 Mack Merit Anchor of 25 ppm.

Figure 2 (attached) shows the current industry EWMA severity, EWMA precision, and cusum charts for Cylinder Liner Wear (CLW). CLW is currently within control chart limits. For this period, CLW is trending an average of 0.65 Δ/s severe. This is equivalent to 2.4 microns.

Figure 3 (attached) shows the current industry EWMA severity, EWMA precision, and cusum charts for Top Ring Weight Loss (TRWL). TRWL is currently within control chart limits. For this period, TRWL is trending an average of 0.80 Δ/s severe. This is equivalent to 22.6 mg.

Figure 4 (attached) shows the current industry EWMA severity, EWMA precision, and cusum charts for Oil Consumption (OC). OC is in an industry action alarm for precision. For this period, OC is trending an average of 0.12 Δ /s severe. This is equivalent to 0.009 natural log units or approximately 0.6 g/h at the CJ-4 Mack Merit Anchor of 65 g/h.

Figure 5 (attached) shows the current industry EWMA severity, EWMA precision, and cusum charts for Delta PB 250 – 300 Hours (PB2). PB2 is currently within control chart limits. For this period, PB2 is on target.

Precision estimates will be presented on an annual basis, in the table below. The precision estimate for 2005 was primarily generated from PC-10 Matrix or concurrent reference test results. The estimates for 2007 show some degradation for PB and TRWL, while CLW shows some improvement. PB2 and OC are within historical levels.

T-12 Precision Estimates

Parameter	2005	2006	2007	2008
Df	21	12	5	
PB (ln units)	0.259	0.203	0.281	
CLW	3.87	3.78	3.35	
TRWL	28.4	28.6	34.9	
OC (ln units)	0.080	0.084	0.088	
PB2 (ln units)	0.344	0.321	0.339	

Reference Oils:

The current reference oil test targets are shown below. These targets are base upon oil 821 and will be used for the first four tests on oil 821-1.

Oils	N	Parameter	Mean (cSt)	S
821-1	25*	PB	3.106	0.242
		CLW	16.2	3.7
		TRWL	62.0	28.2
		OC	4.093	0.079
		PB2	2.125	0.333

*Twenty-five tests on oil 821.

The table below shows the current supply of reference oil.

Oils	TMC Inventory (gallons)	Lab Inventory (# of samples)	Estimated Life (years)
821	899	4	4 years

Information Letters:

No Information Letters were issued this period.

TMC Laboratory Visits:

No TMC laboratory visits were conducted this ASTM period

Additional Information:

The T-12 Timeline is attached as Figure 6.

The T-12 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/mem08-021.jac.doc

Attachments

c: J.L. Zalar, TMC

F.M. Farber, TMC

Mack Test Surveillance Panel

<ftp://ftp.astmtmc.cmu.edu/docs/diesel/mack/semiannualreports/T-12/T12-04-2008.pdf>

Distribution: Email

FIGURE 1
MACK T-12 INDUSTRY OPERATIONALLY VALID DATA

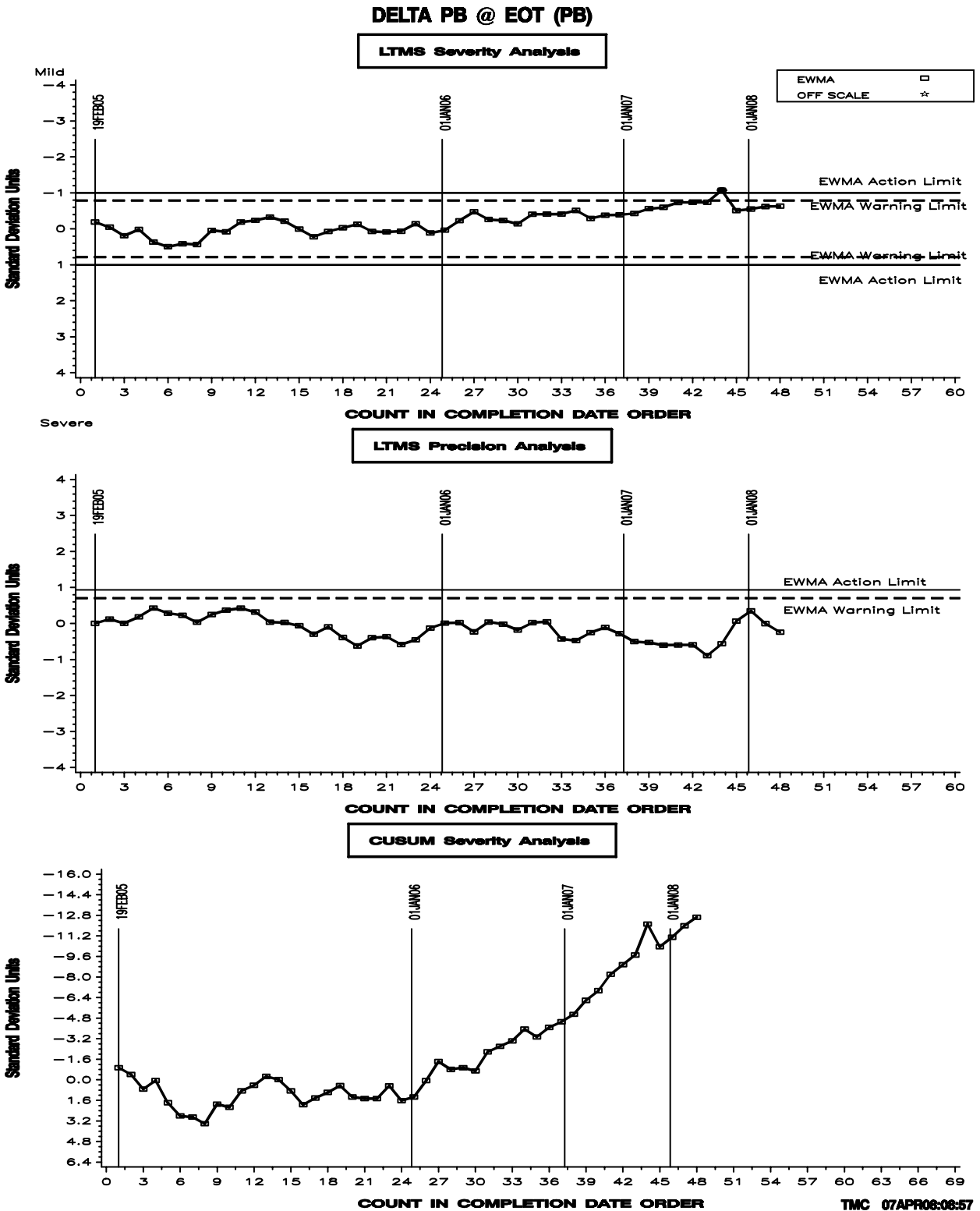


FIGURE 2 MACK T-12 INDUSTRY OPERATIONALLY VALID DATA

AVG. CYLINDER LINER WEAR (CLW)

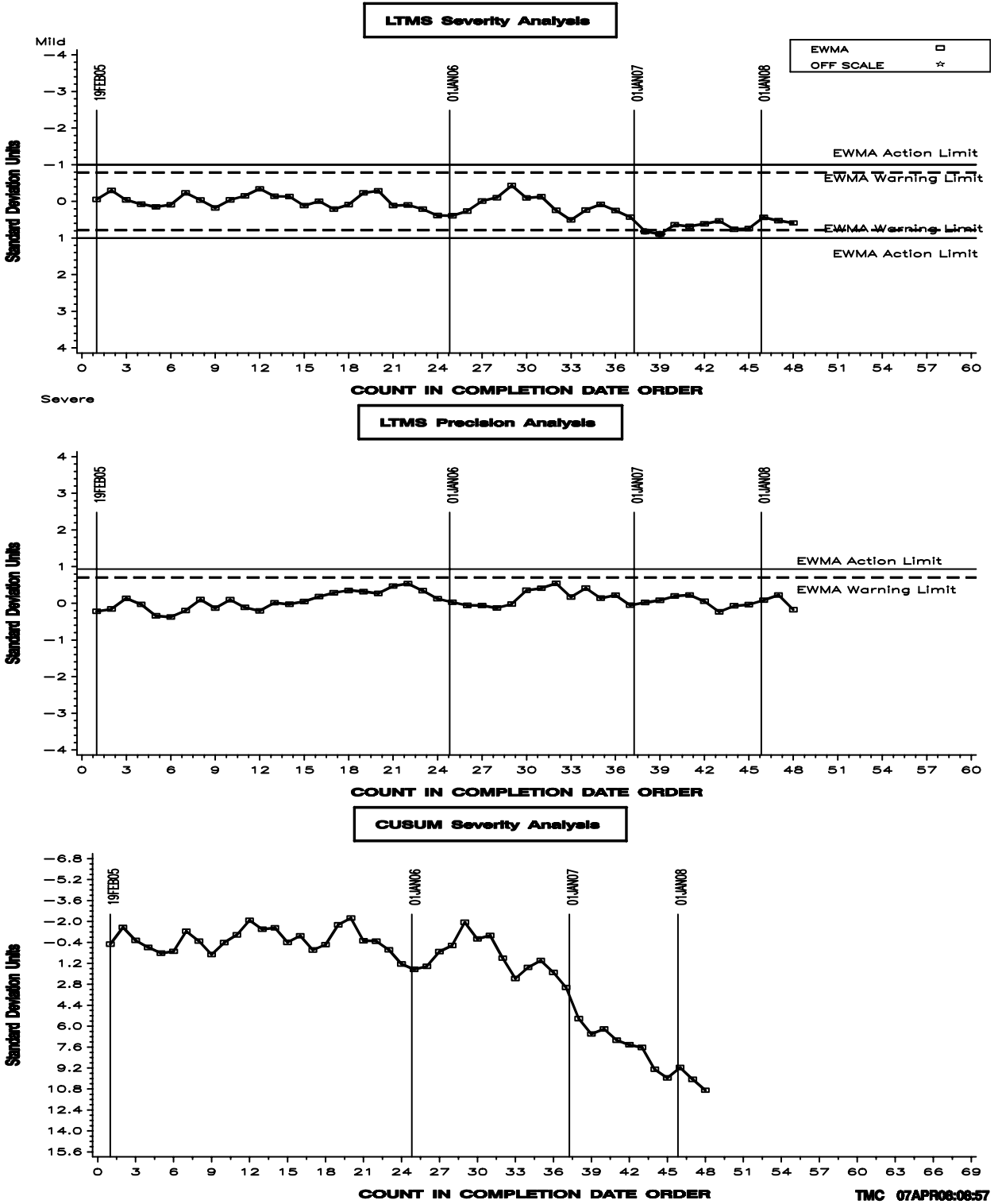


FIGURE 3 MACK T-12 INDUSTRY OPERATIONALLY VALID DATA

AVG. TOP RING WEIGHT LOSS (TRWL)

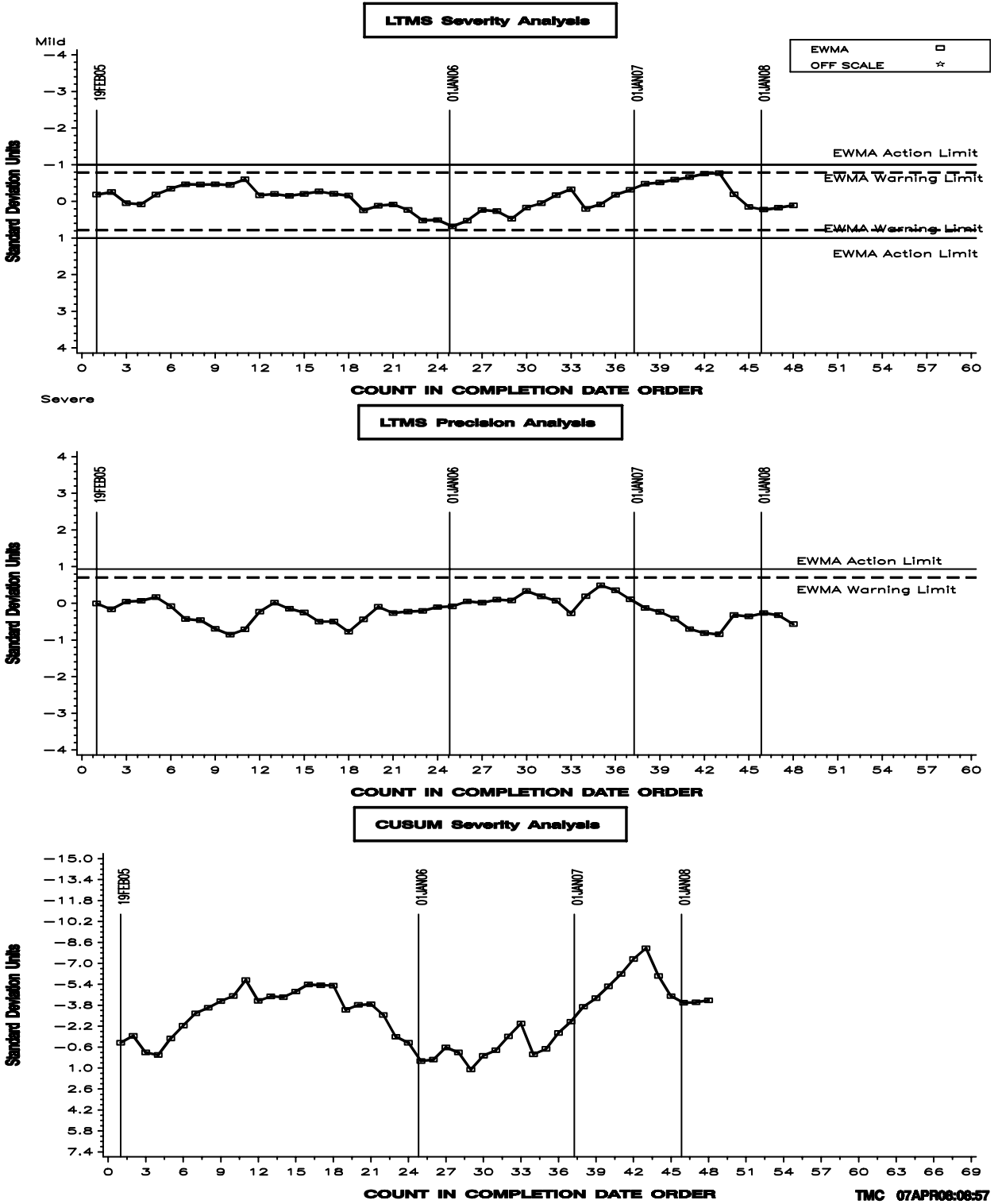


FIGURE 4
MACK T-12 INDUSTRY OPERATIONALLY VALID DATA

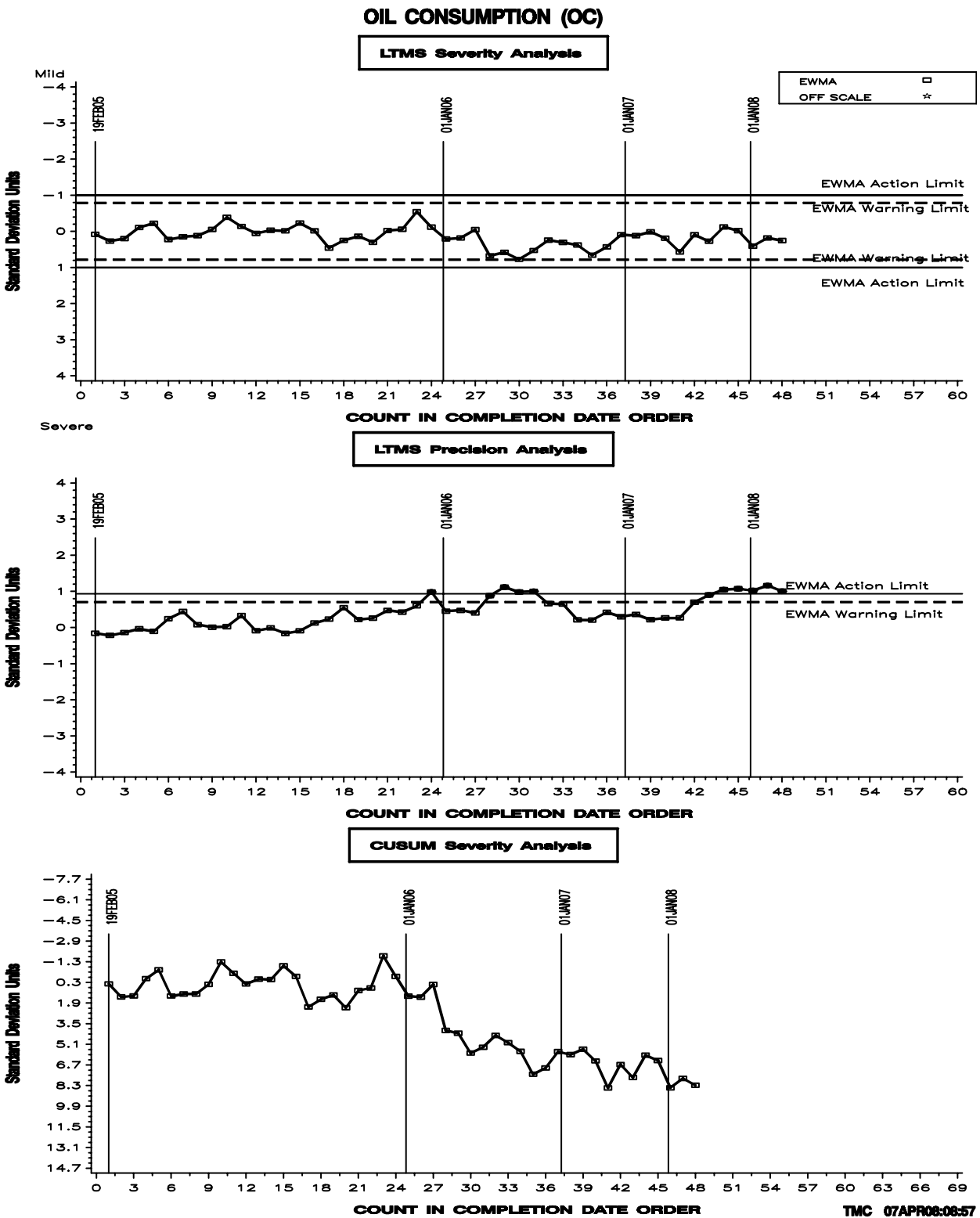


FIGURE 5 MACK T-12 INDUSTRY OPERATIONALLY VALID DATA

DELTA PB 250-300H (PB2)

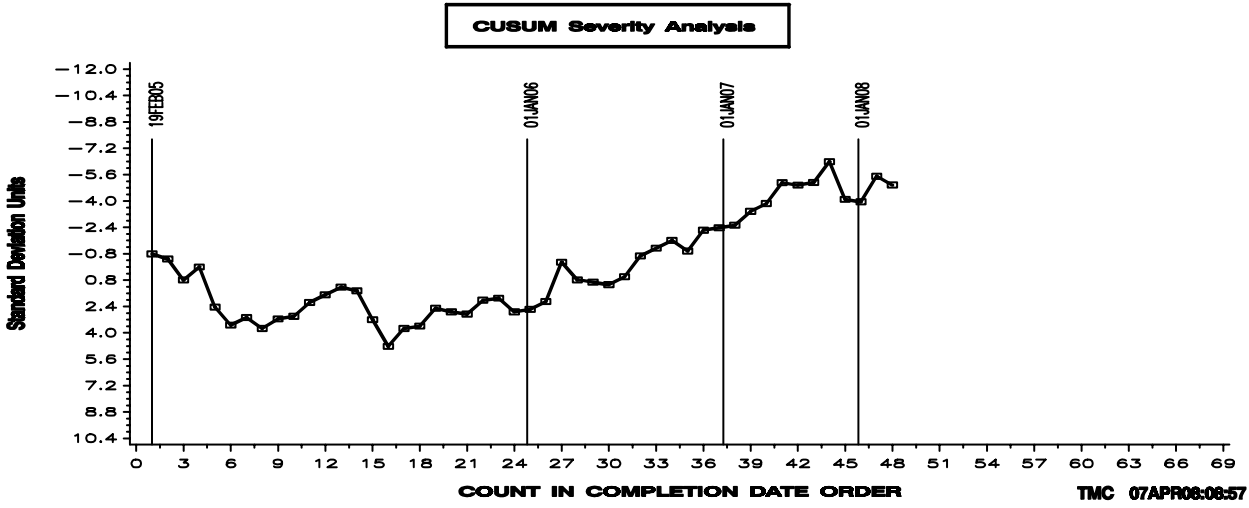
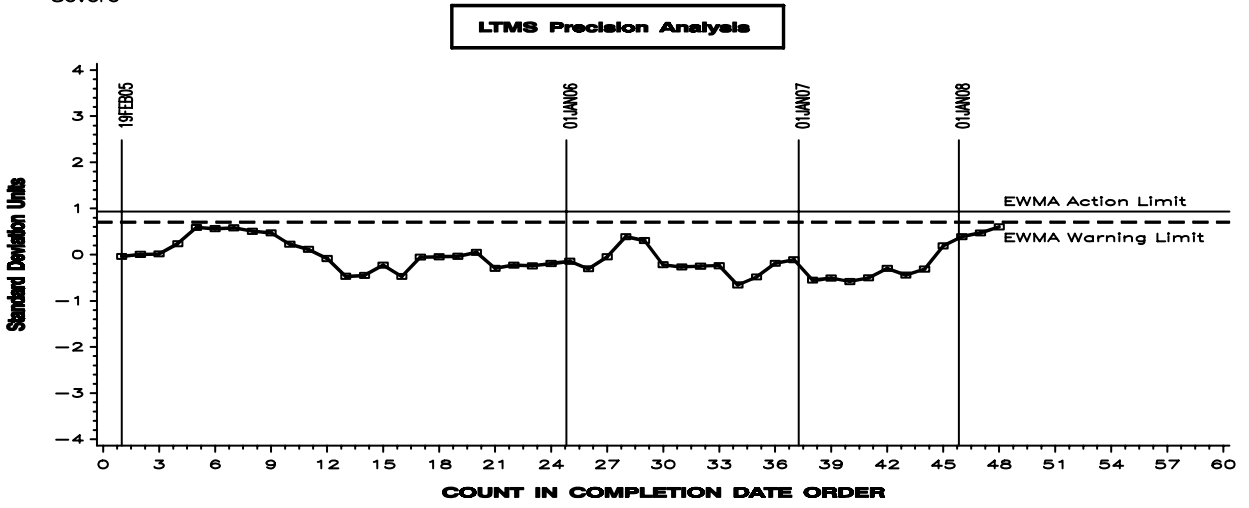
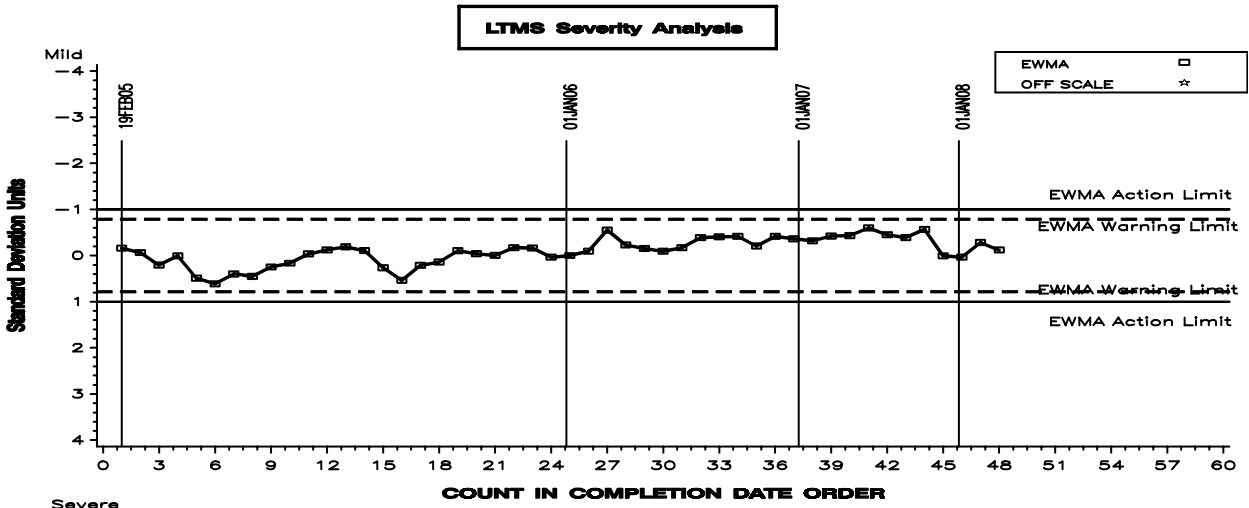


FIGURE 6

T12 Timeline

08:47 Monday, April 7, 2008 1

Obs	effective_date	info_letter_number	event
1	20041028		PROCEDURE DRAFT NO. 1 ISSUED
2	20041119		PROCEDURE DRAFT NO. 2 ISSUED
3	20050324		PROCEDURE DRAFT NO. 3 ISSUED
4	20050426		PROCEDURE DRAFT NO. 4 ISSUED
5	20050429		BEGINNING OF PC-10 MATRIX
6	20050525		PROCEDURE DRAFT NO. 5 ISSUED
7	20050613		'NEW' RING BATCH INTRODUCED
8	20050911		COMPLETION OF PC-10 MATRIX
9	20051116		INTAKE MANIFOLD PRESSURE SPECIFICATION: PHASEII 307 +/- 5 kPa. EXHAUST CO2 NON-CONTROLLED.
10	20051205		LTMS IMPLEMENTED
11	20060308		PROCEDURE DRAFT NO. 6 ISSUED
12	20060410		PROCEDURE DRAFT NO. 6A ISSUED
13	20060512		PROCEDURE DRAFT NO. 7 ISSUED
14	20060713		PROCEDURE DRAFT NO. 8 ISSUED
15	20070130		PROCEDURE DRAFT NO. 9 ISSUED
16	20070201	07-1	D 129 removed as fuel sulfur measurement.
17	20070201	07-1	Piston deposits dropped from test procedure.
18	20070201	07-1	Valve guide reaming procedure updated.
19	20070201	07-1	Quality Index approved for determining operational validity.
20	20070501		PROCEDURE DRAFT NO. 10 ISSUED
21	20070503	07-2	Appendix X1 T-10 Mack Merit Calculations Using T-12 Test results added to test procedure.
22	20080313		Test targets updated (n = 25 for oil 821). Targets to be used for 821-1.
23	20080327		Oil 821-1 introduced.