Test Monitoring Center
6555 Penn Avenue
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(412) 365-1000

MEMORANDUM: 00-174

DATE: November 30, 2000

TO: Stacy Bond,
Chairman, Single Cylinder Diesel Surveillance Panel

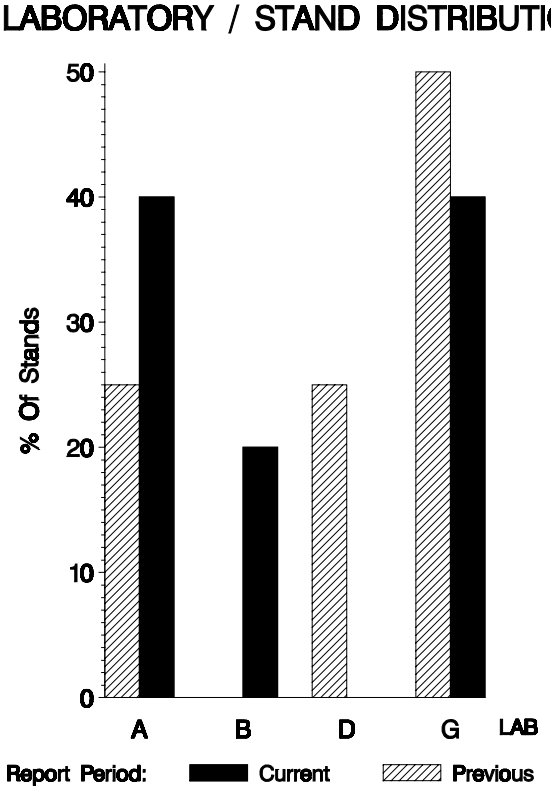
FROM: Scott Parke

SUBJECT: 1P Testing from April 1, 2000 through September 30, 2000

Six calibration tests were reported to the Test Monitoring Center during the period from April 1, 2000 through September 30, 2000. The data from the operationally valid tests is shown on page 8. Following is a summary of testing activity this period.

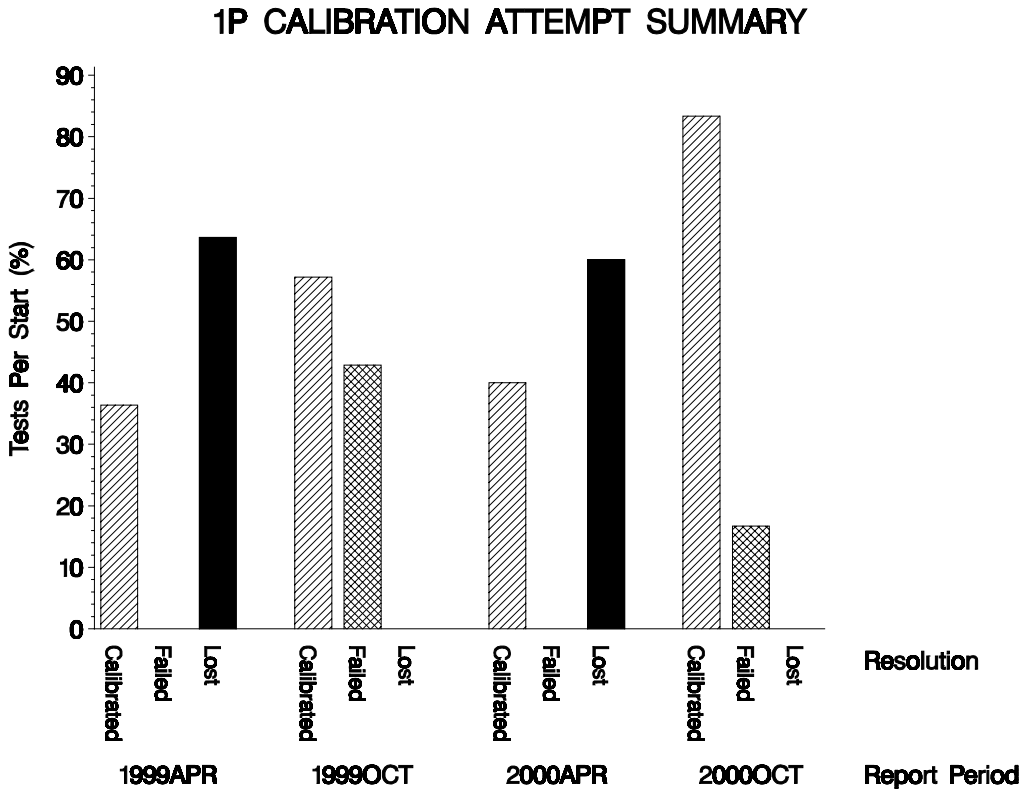
	Reporting Data	Calibrated on 3-31-00
Number of Labs	3	3
Number of Stands	5	5

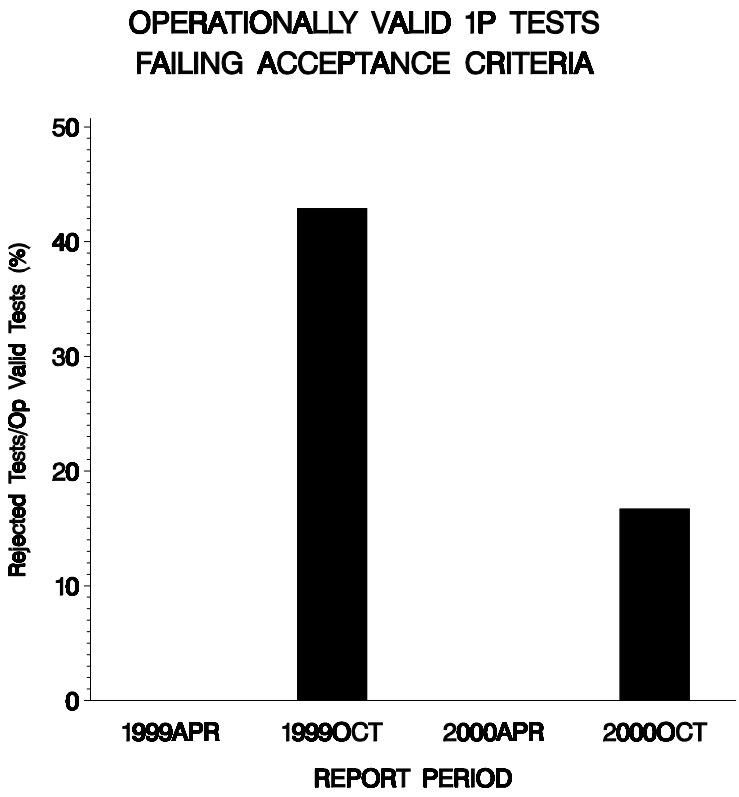
Stands reporting data this period were distributed as shown below:



Test Distribution by Oil and Validity

		1004-3	1005-1	Totals Last Period	Totals This Period
Accepted for Calibration	AC	0	5	2	5
Rejected Mild	OC	0	0	0	0
Rejected Severe	OC	0	1	0	1
Rejected for EWMA Precision	OC	0	0	0	0
Rejected for Shewhart Precision	OC	0	0	0	0
Operationally Invalid (lab)	LC	0	0	1	0
Operationally Invalid (lab/TMC)	RC	0	0	1	0
Aborted Calibration	XC	0	0	1	0
Total		0	6	5	6

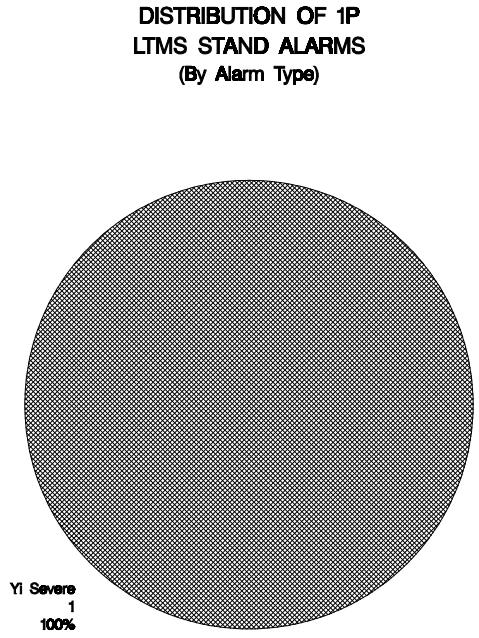


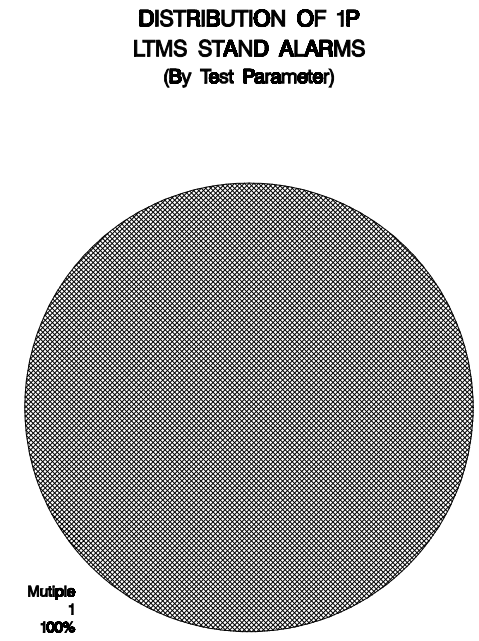


The above chart shows the percentage of failed but operationally valid tests.

No LTMS deviations were written this period (none have ever been written for this test).

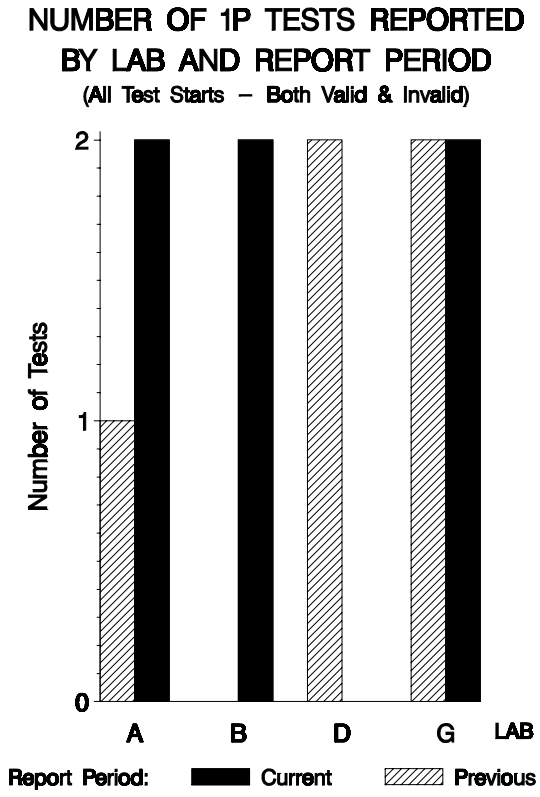
Shown below is the distribution by type and parameter of the alarms causing the failures for this period.



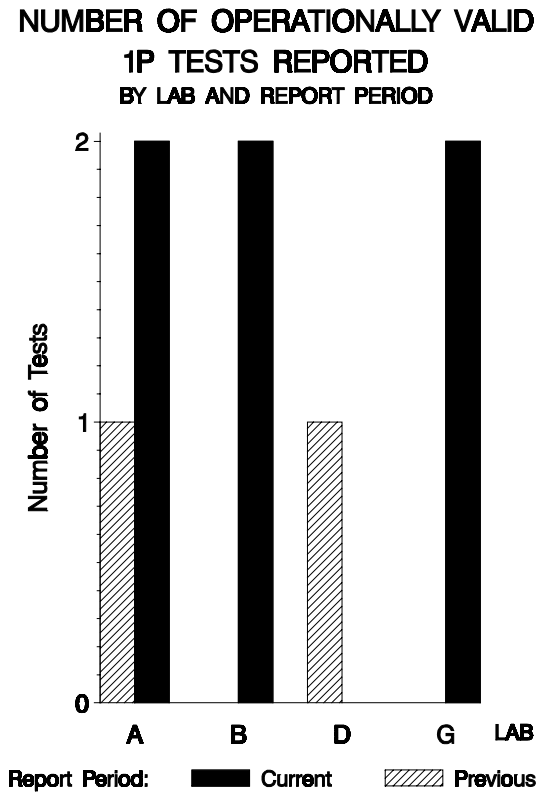


One test failed. It was severe on multiple parameters.

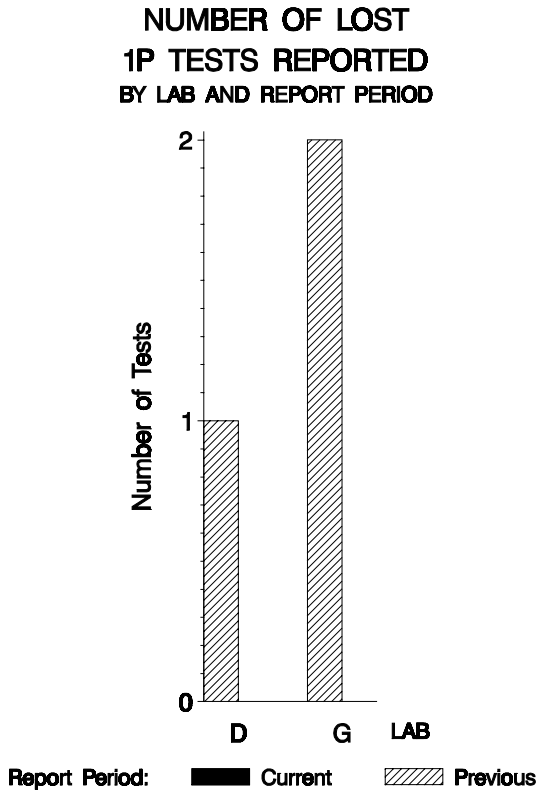
By lab, the tests run this report period were distributed as shown below:



With all operationally invalid tests removed, the distribution looks like this:



And the by-lab distribution of lost tests:



Lost Tests per Start by Oil and Lab

	1004-3			1005-1			Total		
Lab	Lost	Starts	%	Lost	Starts	%	Lost	Starts	%
A				0	2	0	0	2	0
B				0	2	0	0	2	0
G				0	2	0	0	2	0
Total				0	6	0	0	6	0

Lost tests are those that were either aborted, rejected by lab, or operationally invalid. No tests were classified as lost this period.

Causes for Lost Tests

Lab	Cause		Oil		Validity			Loss Rate		
			1004-3	1005-1	LC	RC	XC	Lost	Starts	%
	No tests were lost this period.									
		Lost	0	0						
		Starts	0	6	6	6	6			
		%	0%	0%	0%	0%	0%			

Average Δ/s by Lab						
Lab	n	TGC	WDP	TLC	OC*	EOTOC*
A	2	0.287	0.848	0.380	0.695	1.209
B	2	1.289	1.965	0.522	1.162	1.670
G	2	0.126	0.595	0.380	0.200	1.054
Industry	6	0.567	1.136	0.427	0.686	1.311

* Transformed

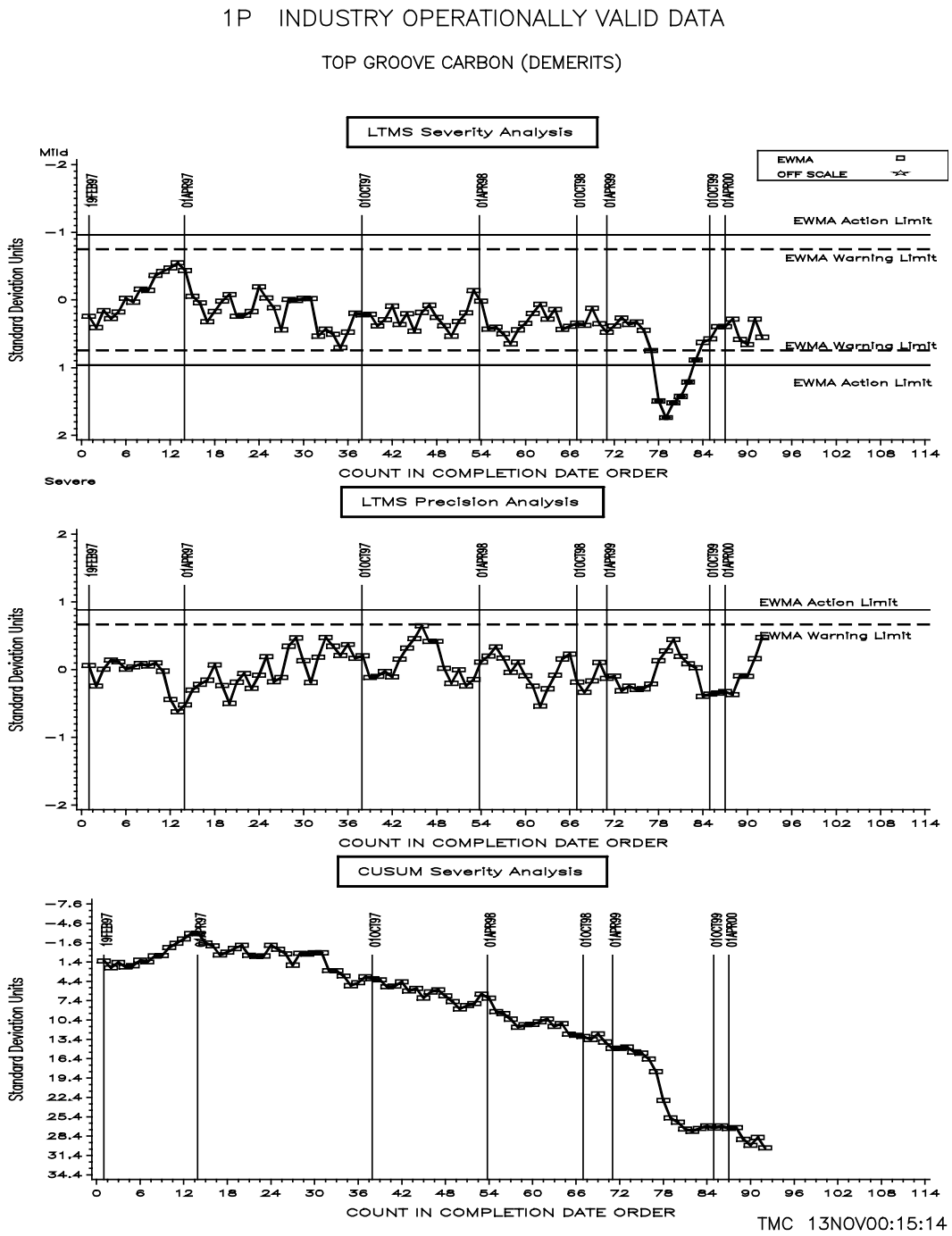
DATA FROM ALL OPERATIONALLY VALID TESTS REPORTED THIS PERIOD:

LTMS DATE	LAB	STAND	OIL	TG	WD	TL	OC	ETOC	TGYI	WDYI	TLYI	OCYI	ETOCYI
20000402	G	1	1005-1	31.75	337.3	34.50	7.4	7.8	0.401	0.903	0.275	0.424	0.874
20000422	G	3	1005-1	27.50	301.8	37.25	6.4	9.4	-0.149	0.286	0.484	-0.024	1.235
20000425	A	2	1005-1	42.50	377.5	43.00	8.7	10.5	1.789	1.601	0.922	0.924	1.448
20000525	B	2	1005-1	36.00	449.8	39.00	9.2	14.3	0.950	2.856	0.617	1.097	2.045
20000706	A	1	1005-1	19.25	290.8	28.75	7.5	8.2	-1.214	0.095	-0.162	0.466	0.971
20000708	B	2	1005-1	41.25	347.2	36.50	9.6	9.7	1.628	1.075	0.427	1.228	1.295

DISCUSSION OF INDUSTRY PERFORMANCE OVER THIS PERIOD

TGC:

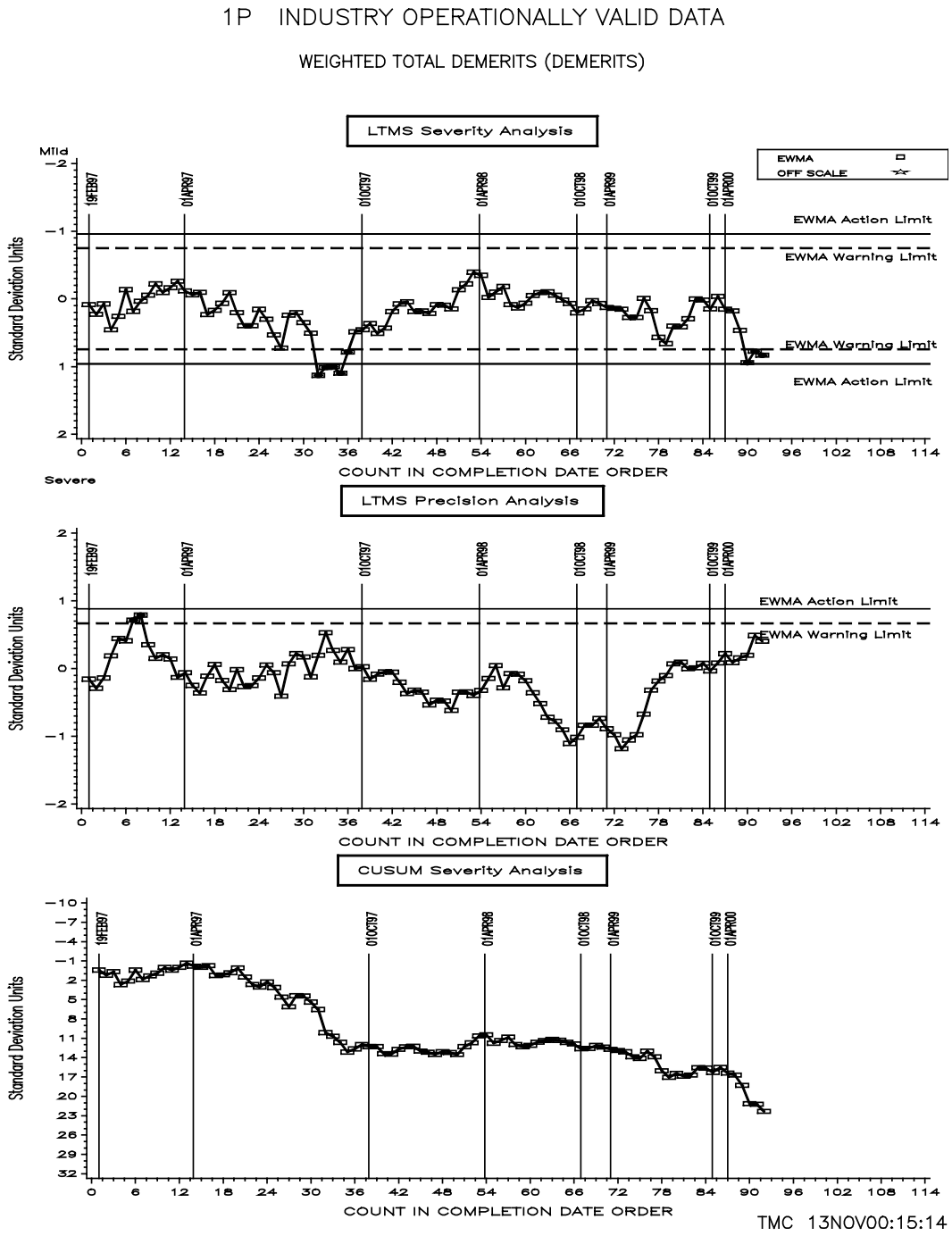
Average Yi for tests reported this period was 0.567 (see table on previous page). Using the homogeneous dataset standard deviation for TGC (7.74 demerits) to compute an average Δ yields 4.39 demerits. Severity and precision remained within acceptable limits throughout this period.



Shown above is the LTMS/Cusum plot for TGC.

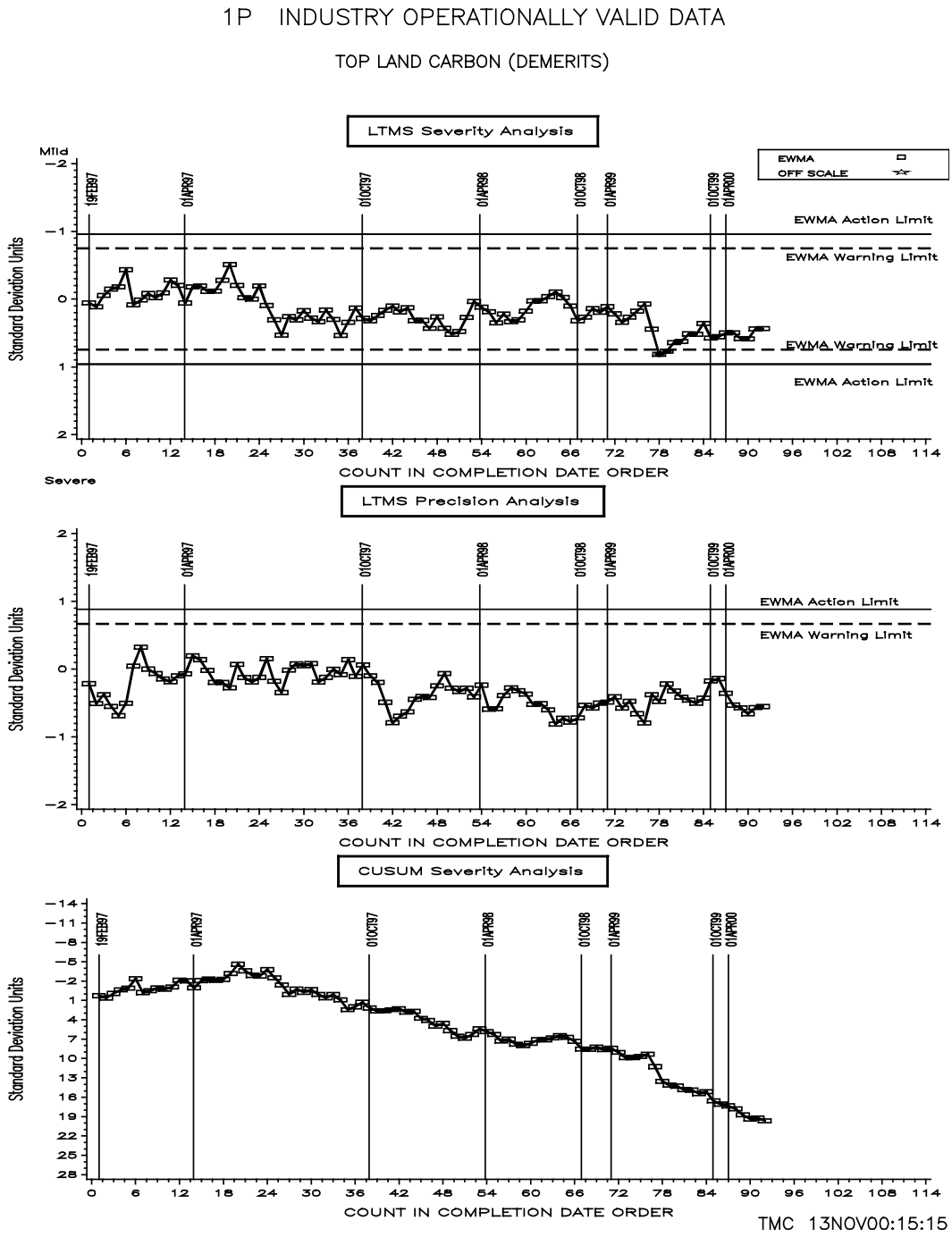
WDP:

Largely due to one especially severe test, average Yi for WDP this period was 1.136 (see table on page 8). The homogeneous dataset standard deviation of 57.6 converts this to 65.4 demerits. Severity is currently exceeding the warning limit (again, due to the already-mentioned severe test) while precision remained within acceptable limits. The LTMS/Cusum plot is shown below.



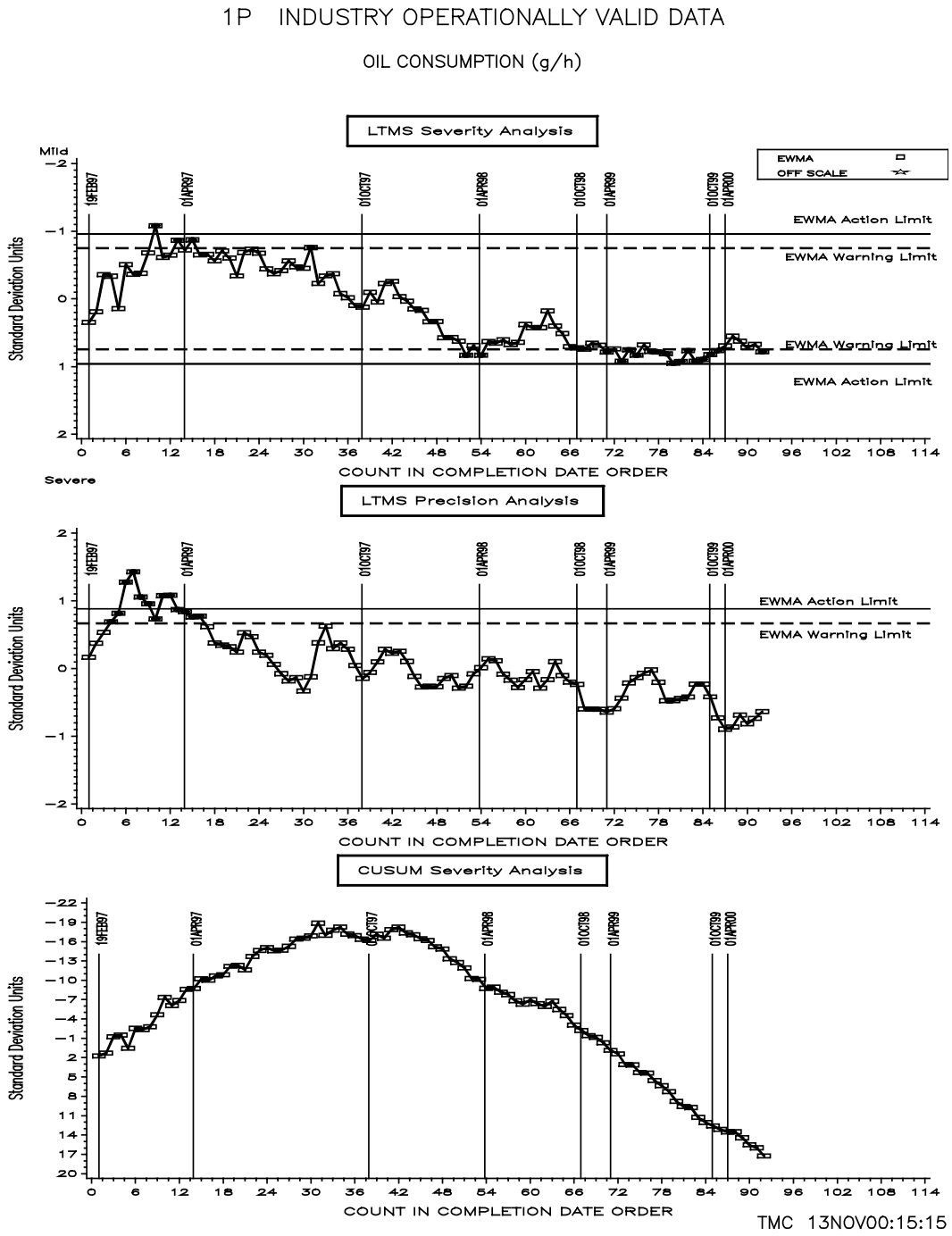
TLC:

The average TLC Yi for this report period was 0.427 (see table on page 8). Using the homogeneous dataset standard deviation of 13.15 to compute an average delta yields 5.62 severe. This parameter shows a slight severe trend overall but has remained within both severity and precision limits. The LTMS/Cusum chart is shown below.



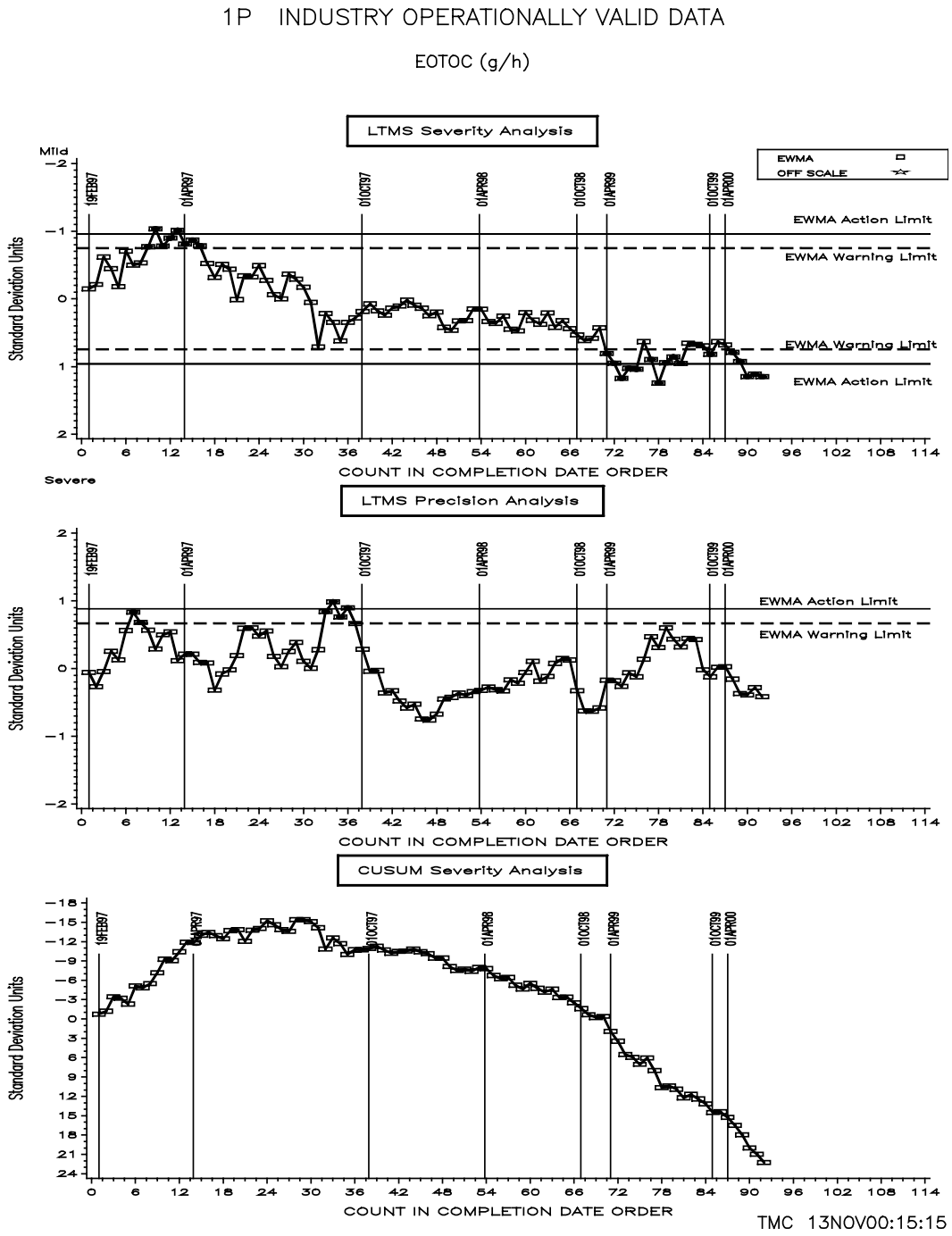
Oil Consumption (OC):

The transformed OC Yi results this period averaged 0.686. Computing an average transformed delta using the homogeneous dataset standard deviation of 0.3238 gives 0.2221. Back-transforming this value gives 1.25 g/h severe. This parameter has been severe since the completion of the matrix. Precision remained within acceptable limits. The LTMS/Cusum plot for OC is shown below.



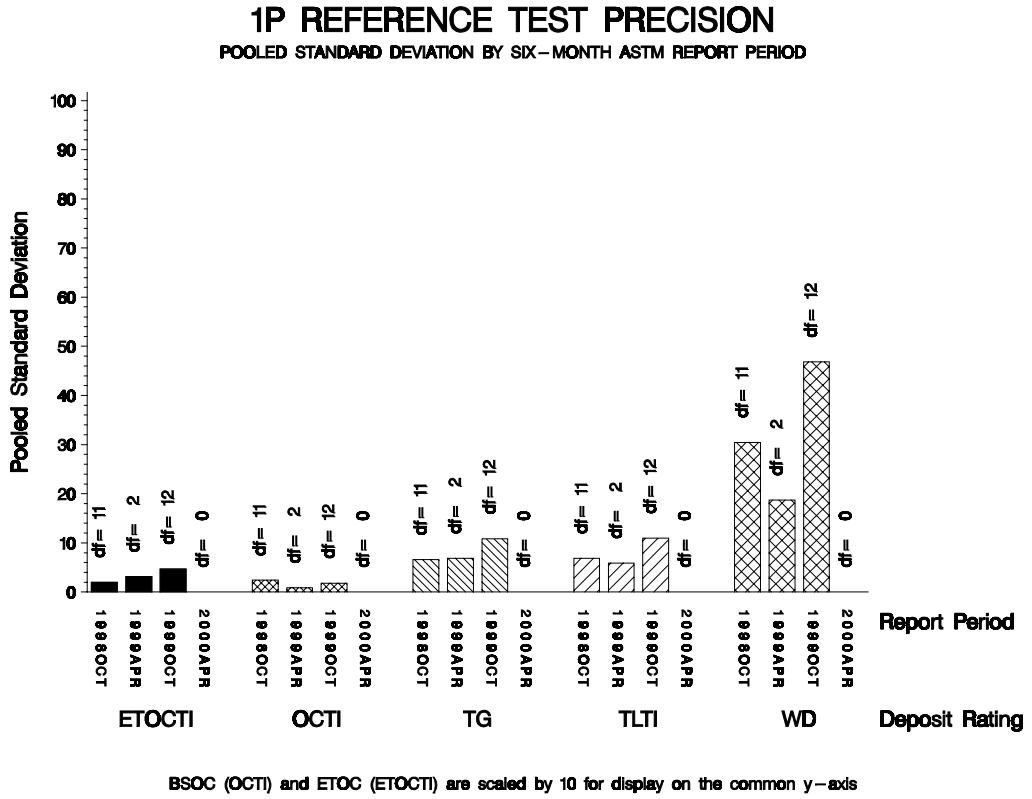
EOT Oil Consumption (ETOC):

The average of the transformed ETOC Yi results this period was 1.311 which, using the homogeneous dataset standard deviation of 0.5177, converts to 0.6787 which back-transforms to 1.97 g/h. As with average oil consumption, ETOC has been severe since the end of the matrix. Precision remained within acceptable limits. The LTMS/Cusum plot for ETOC is shown below.



POOLED S:

Shown below is a bar chart comparing the pooled s values for the 1P test parameters over the last four report periods. Please note that the values for oil consumption (OCTI) and end of test oil consumption (ETOCTI) have been multiplied by 10 to allow these parameters to be shown on the same plot as the other parameters.



QUALITY INDEX:

One Quality Index Deviation was written this period. When an adjacent 1Q stand was installed, the effect on the central air handling system of a 1Q stand shutting down (with the direct inlet-to-exhaust path provided by the EGR cooler) was not sufficiently accounted for. Thus, until the problem was corrected, several adjacent 1Q shutdowns caused low airflow spikes in the 1P stand's inlet air pressure.

Seven other QI Deviations have been written for the 1P test. Three were written for tests from one lab experiencing QI implementation problems during the installation of new control hardware in February of 1998 (the QI requirements were implemented in January of 1998); one was for the same lab while again installing the same hardware on another stand in May of 1998; two were for a lab that experienced a lab-wide catastrophic failure of the air handling system causing an instantaneous loss of air pressure in June of 1998. The most recent was due to a valve failure (caught and corrected within one hour) that caused an off spec coolant out temperature for a test reported in August of 1999.

Shown on the following page is a plot showing all QI's reported to date for all controlled parameters.

Figures along the horizontal axis indicate the number of post−matrix tests where QI < 0.000
Dots represent matrix tests; dashes represent post−matrix tests

STATUS OF REFERENCE OIL SUPPLY:

At the end of this report period, the testing oil supply stood as outlined in the following table:

		@ TMC	
Oil	Cans @ Labs	Cans	Gallons
1004-3	13	213	3204
1005	5	5	83
1005-1	18	87	1314
Total	36	305	4601

* Future reblends of oils marked with an asterisk are not obtainable by TMC.

Be aware that this table presumes that *all* of each of these oils is dedicated to the 1P test area. All of these oils are also used in the other diesel test areas.

TIMELINE OF SIGNIFICANT EVENTS IN THE LIFE OF THE 1P TEST:

Effective Date	Info Letter	
19970219		START OF 1P MATRIX
19970604		LAST 1P MATRIX TEST
19980924	98-1	SPEC AND CALIBRATION PROCEDURE FOR OIL WEIGH SCALE PUMPS ADDED
19980924	98-1	BRAIDED STAINLESS STEEL/TEFLON HOSES REQUIRED FOR WEIGH SCALE
19980924	98-1	PRE-TEST LINER CLEANING - USE ONLY EF-411 FOR RUST PREVENTION
19980924	98-1	INSTRUCTIONS FOR VALIDITY DECLARATION
19980924	98-1	RATING VERIFICATION REQUIRED
19980924	98-1	REVISIONS TO THERMOCOUPLE SPECIFICATIONS - DIAMETER SPEC REMOVED
19980924	98-1	DUMMY INLET AIR HEATERS PERMITTED
19980924	98-1	INSTRUCTIONS FOR GROUPING AND ROUNDING PISTON AREAS FOR RATING
19980924	98-1	REPORT FORM AND DATA DICTIONARY CHANGES
19990419	99-1	TEST STAND INSTRUMENTATION CALIBRATION REQUIREMENTS
19990419	99-1	VISUAL INSPECTION OF INTAKE AIR BARRELS
19990419	99-1	RE-CALIBRATION REQUIREMENTS WHEN CRANK IS REMOVED
19990419	99-1	USE OF MOBIL EF-411 AS BUILD-UP/FLUSHING OIL

RATING:
During this report period, three 1P tests required re-rating The table below summarizes the re-rates for this report period:

Rating Re-rate Summary

Total number of re-rates requested	3
Number of tests where lab rating was changed	1
Number of tests where referee rating was changed	1
Number of tests where no changes were made	1

LAB VISITS:
No 1P lab visits were completed during this report period.

INFORMATION LETTERS:
No information letters were issued this report period.

FUEL BATCH APPROVAL:
During this period, the following fuel batches were approved for testing: 0005310, 0005352, 0006442, 0007492, and 0008587.

SUMMARY

- Over the course of this report period, TGC, and TLC remained within acceptable severity limits. Due to one particularly severe test, WD is currently exceeding the warning limit. OC (and ETOC) have been severe since the completion of the matrix.

- Precision for all parameters remained within acceptable limits throughout this report period.

SDP/sdp/astm1000.doc/m00-174.sdp.doc
c: J. L. Zalar
F. M. Farber
A. C. Hahn
Single Cylinder Diesel Surveillance Panel