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

MEMORANDUM: 03-042

DATE: April 23, 2003

TO: James McCord,
Chairman, Single Cylinder Diesel Surveillance Panel

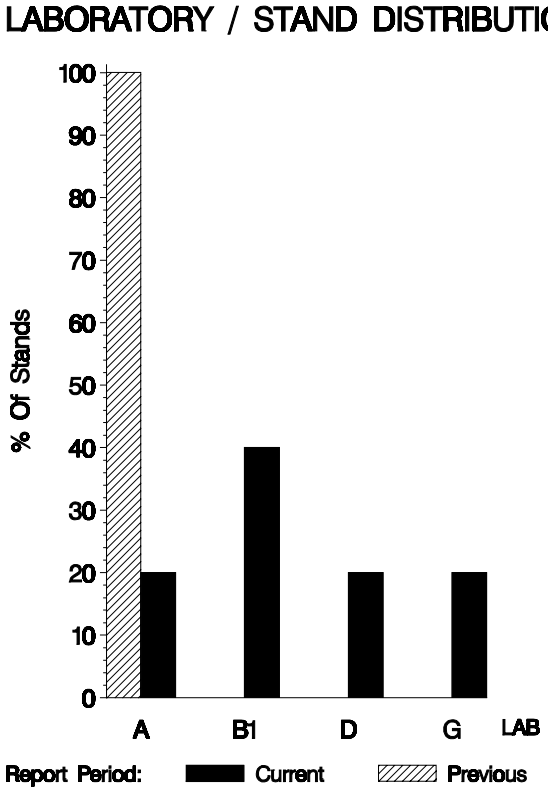
FROM: Scott Parke

SUBJECT: 1N Testing from October 1, 2002 through March 31, 2003

Six calibration tests were reported to the Test Monitoring Center during the period from October 1, 2002 through March 31, 2003. The data from these tests is shown on page 7. Following is a summary of testing activity this period.

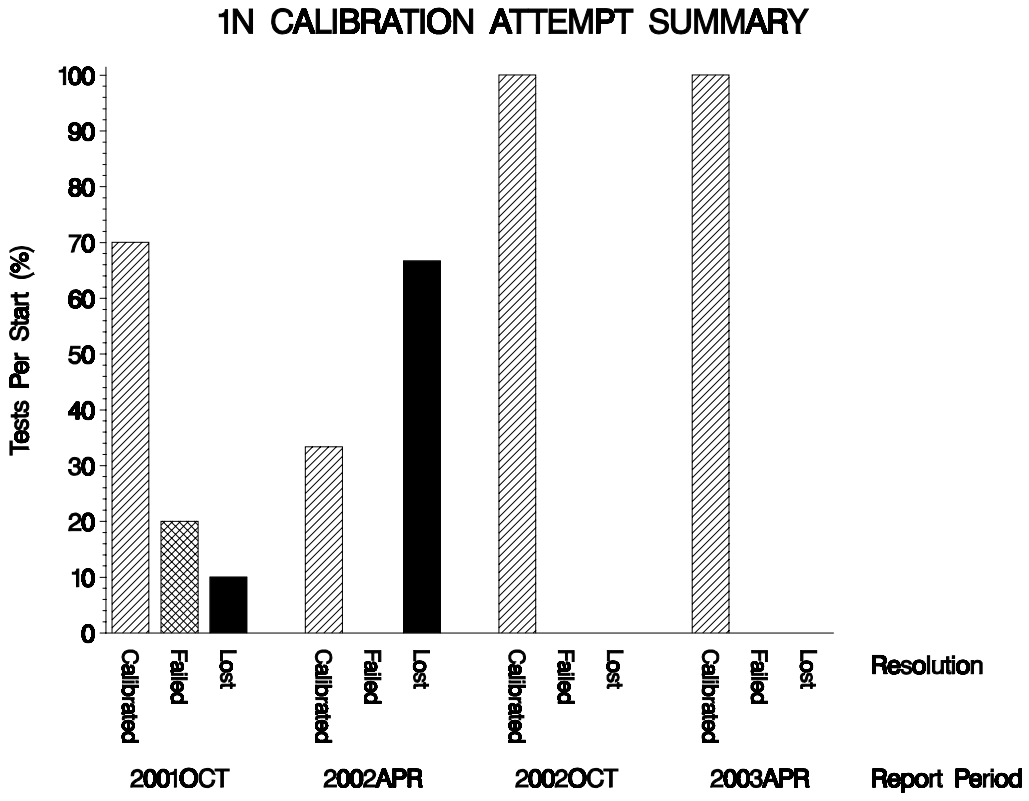
	Reporting Data	Calibrated on 3-31-03
Number of Labs	4	4
Number of Stands	5	6

Stands reporting data this period were distributed as shown below:

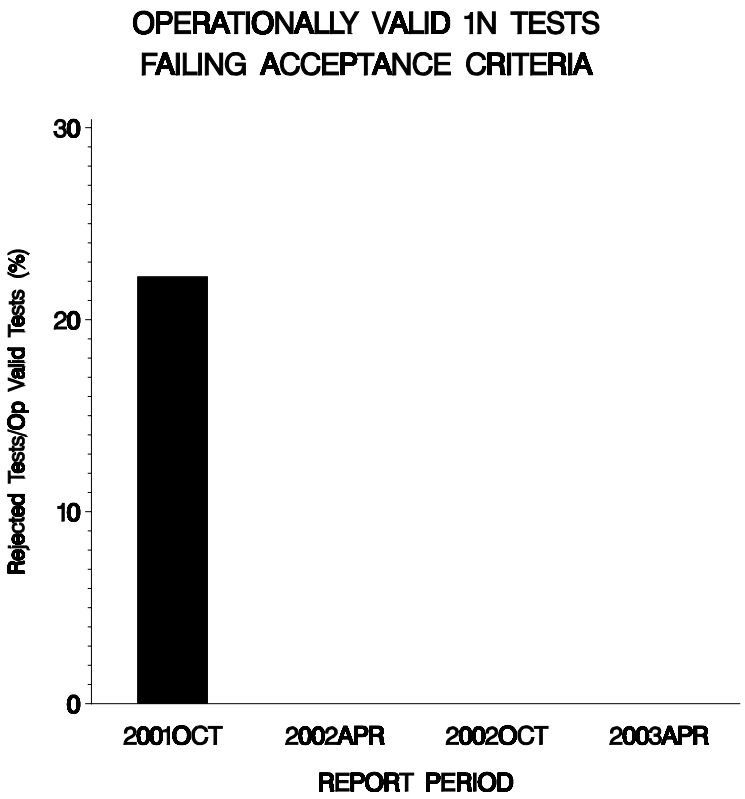


Test Distribution by Oil and Validity

		1004-2	1004-3	809-1	810-2	811-1	Totals Last Period	Totals This Period
Accepted for Calibration	AC	0	4	2	0	0	1	6
Rejected Mild	OC	0	0	0	0	0	0	0
Rejected Severe	OC	0	0	0	0	0	0	0
Rejected for EWMA Precision	OC	0	0	0	0	0	0	0
Rejected for Shewhart Precision	OC	0	0	0	0	0	0	0
Operationally Invalid (lab)	LC	0	0	0	0	0	0	0
Operationally Invalid (lab/TMC)	RC	0	0	0	0	0	0	0
Aborted Calibration	XC	0	0	0	0	0	0	0
Total		0	4	2	0	0	1	6

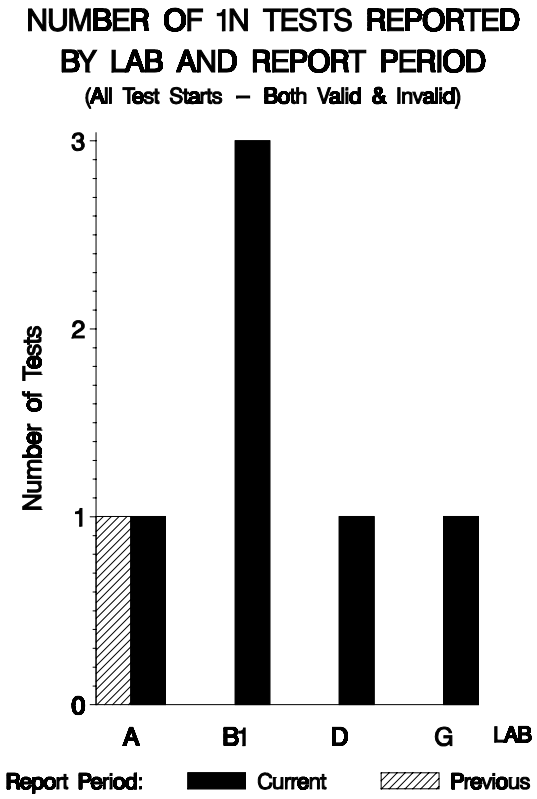


Testing volume for the past several periods has been too low to draw meaningful conclusions from this chart but it is provided for historical context.

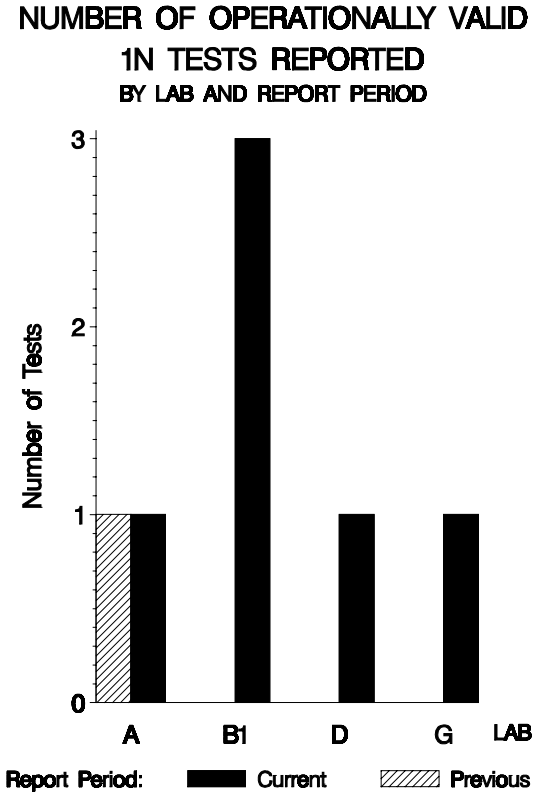


No LTMS deviations were written this period (none have ever been written for this test).

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



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



Lost Tests per Start by Oil and Lab

	1004-2			1004-3			809-1			810-2			811-1			Total		
Lab	Lost	Starts	%	Lost	Starts	%	Lost	Starts	%	Lost	Starts	%	Lost	Starts	%	Lost	Starts	%
A				0	1	0										0	1	0
B1				0	3	0										0	3	0
D								1	0							0	1	0
G								1	0							0	1	0
Total				0	4	0		2	0							0	6	0

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

Causes for Lost Tests

			Oil					Validity			Loss Rate		
Lab	Cause		1004-2	1004-3	809-1	810-2	811-1	LC	RC	XC	Lost	Starts	%
	No tests were lost this period.										0	0	0%
		Lost	0	0	0	0	0	0	0	0			
		Starts	0	4	2	0	0	6	6	6			
		%	0%	0%	0%	0%	0%	0%	0%	0%			

Average Δ/s by Lab					
Lab	n	TGF	WDN	TTLHC*	BSOC
A	1	-0.321	-0.580	-0.609	-0.347
B1	3	-0.917	0.887	-0.609	-0.436
D	1	0.395	-0.369	-1.239	-0.549
G	1	1.663	0.758	1.093	0.186
Industry	6	-0.169	0.412	-0.431	-0.336

* Transformed TLHC

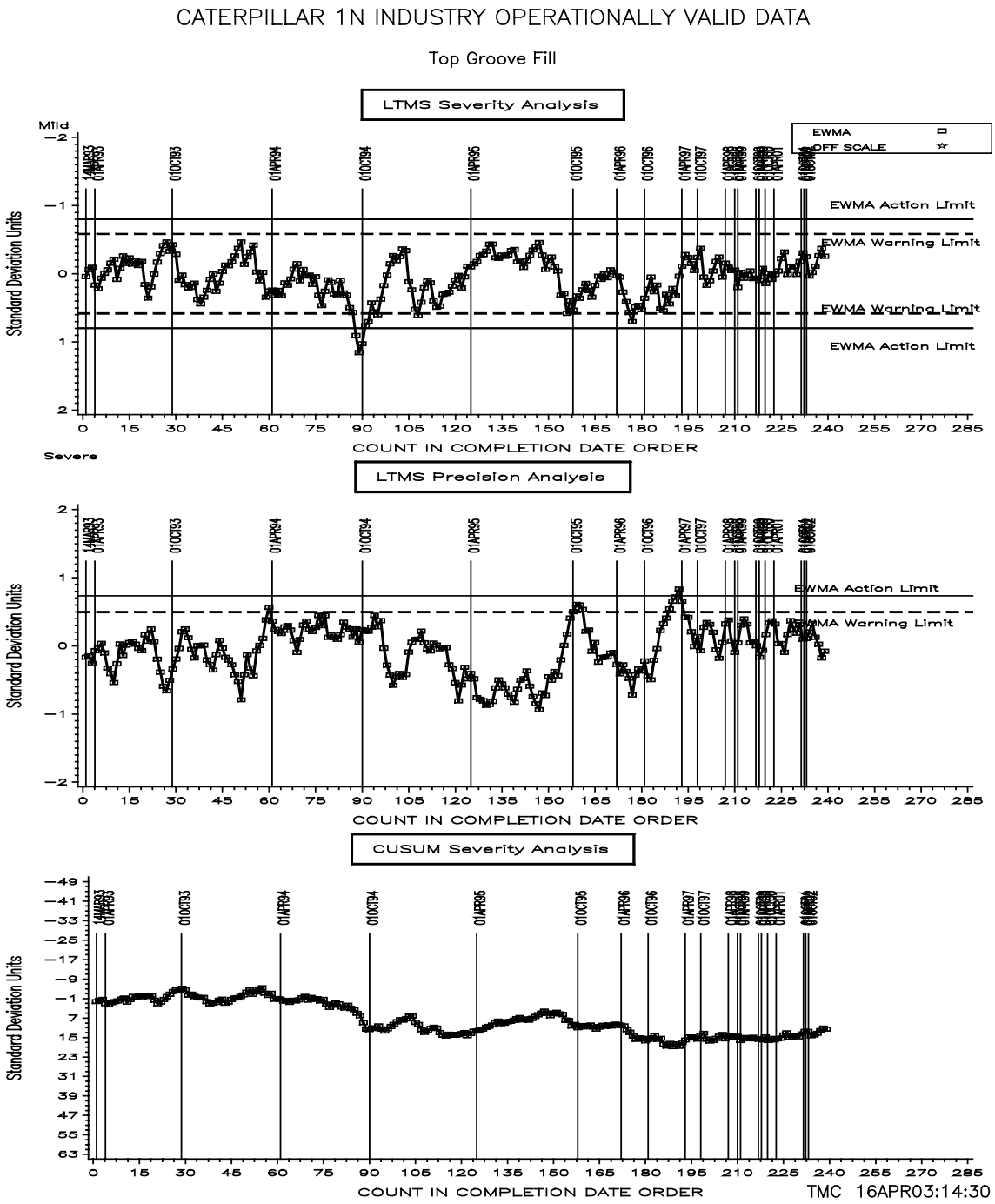
DATA FROM ALL OPERATIONALLY VALID TESTS REPORTED THIS PERIOD:

LTMS DATE	LAB	STAND	OIL	TG	WD	TL	OC	TGYI	WDYI	TLYI	OCYI
20030119	G	9	809-1	68	223.2	12	0.36	1.663	0.758	1.093	0.186
20030125	A	8	1004-3	25	189.1	0	0.18	-0.321	-0.580	-0.609	-0.347
20030207	B1	1A	1004-3	20	193.8	0	0.25	-0.619	-0.397	-0.609	0.587
20030310	B1	1A	1004-3	11	240.2	0	0.13	-1.155	1.409	-0.609	-1.013
20030311	B1	3A	1004-3	14	246.4	0	0.14	-0.976	1.650	-0.609	-0.880
20030330	D	1	809-1	42	185.9	0	0.21	0.395	-0.369	-1.239	-0.549

DISCUSSION OF INDUSTRY PERFORMANCE OVER THIS PERIOD

TGF:

The average TGF Yi this period (shown in the table on the previous page) was –0.169 mild. Using 1004-1's test target standard deviation of 14.6 to compute a Δ yields 2% TGF.

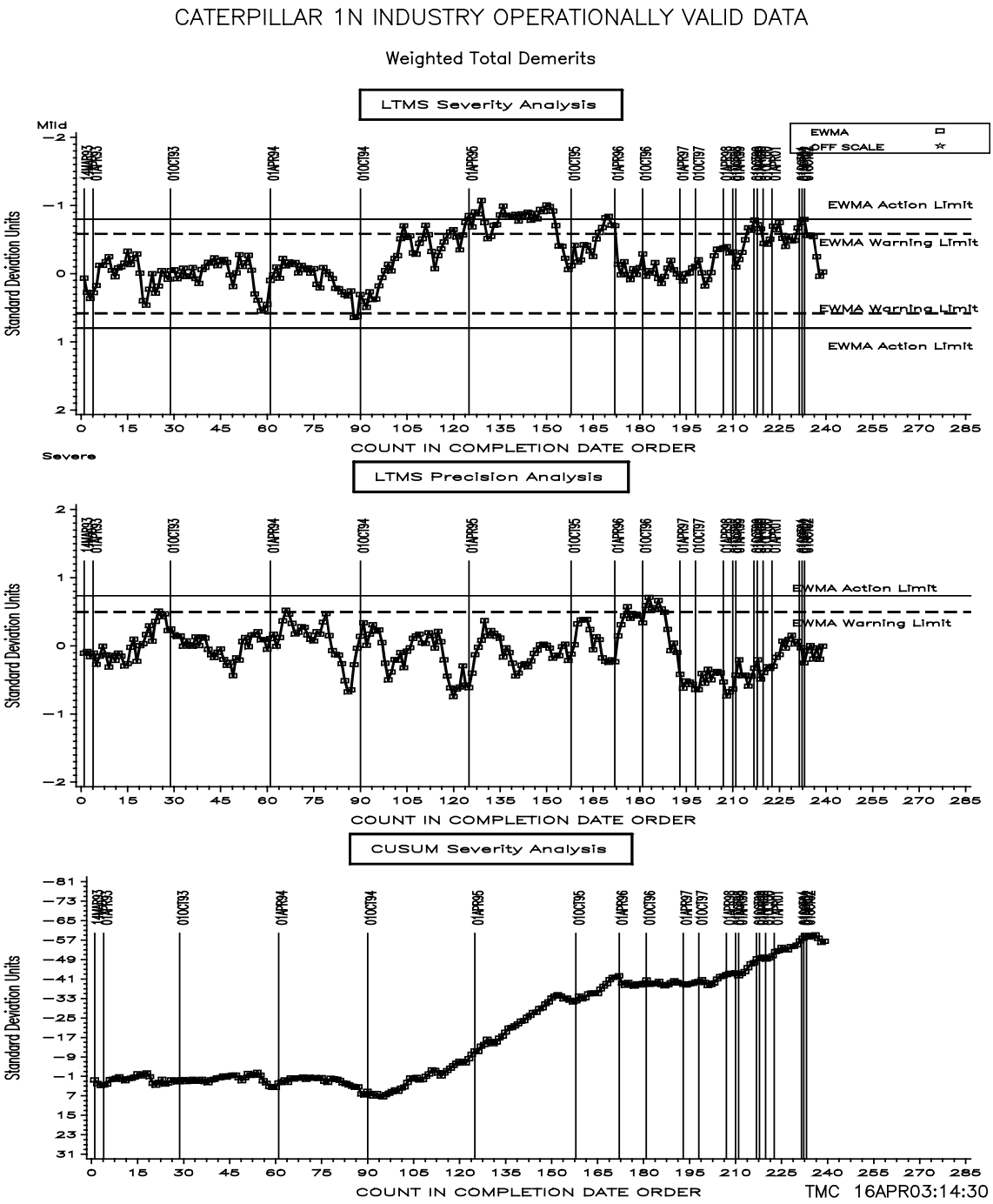


The LTMS/Cusum plot for TGF (shown above) is unremarkable for this period.

WDN:

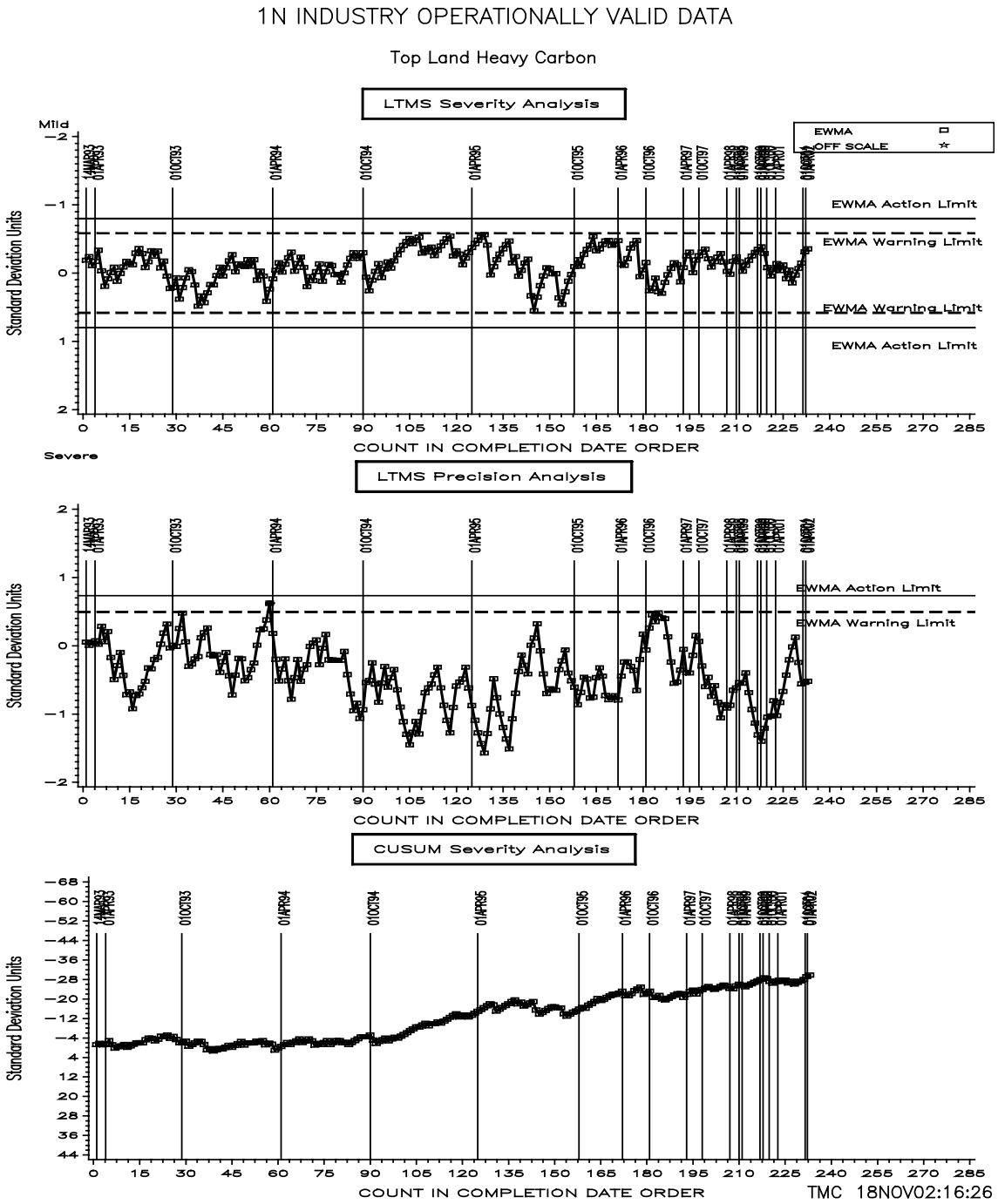
The average WDN Yi reported this period was 0.412 severe (see table on page 7). This translates to 11.2 demerits when multiplied by the target standard deviation for 1004-1 (27.1). This is a marked change from the mild results of the past several periods.

The LTMS/Cusum plot is shown below.



TLHC:

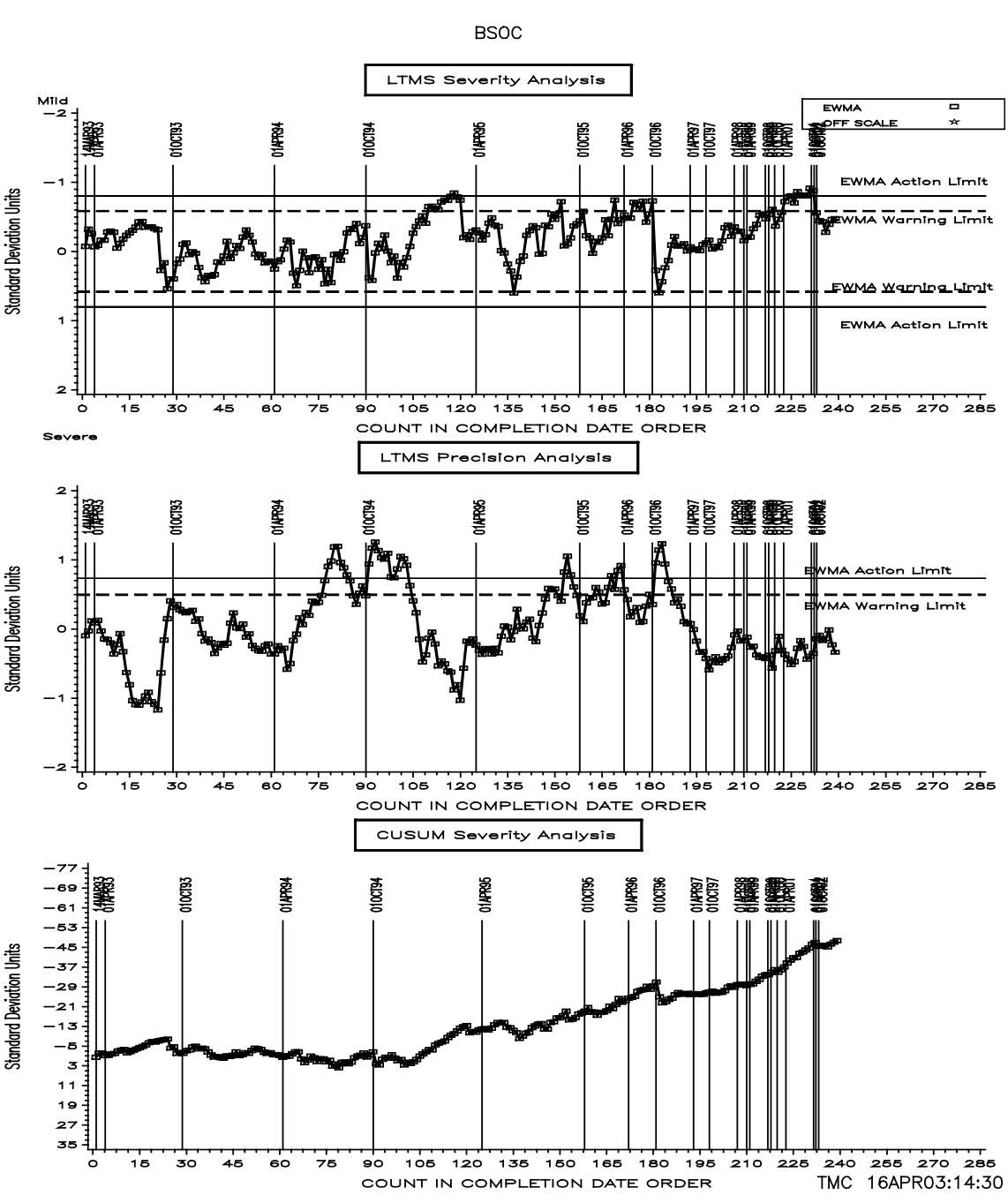
The average TLHC Yi reported this period was -0.431 mild (see table on page 7). Using the test target standard deviation of 0.9 from oil 1004-1 to compute a transformed delta yields -0.388. Back-transforming this value gives less than 1% TLHC.



The LTMS/Cusum plot for transformed TLHC is shown above. Precision and severity were both within limits throughout this report period.

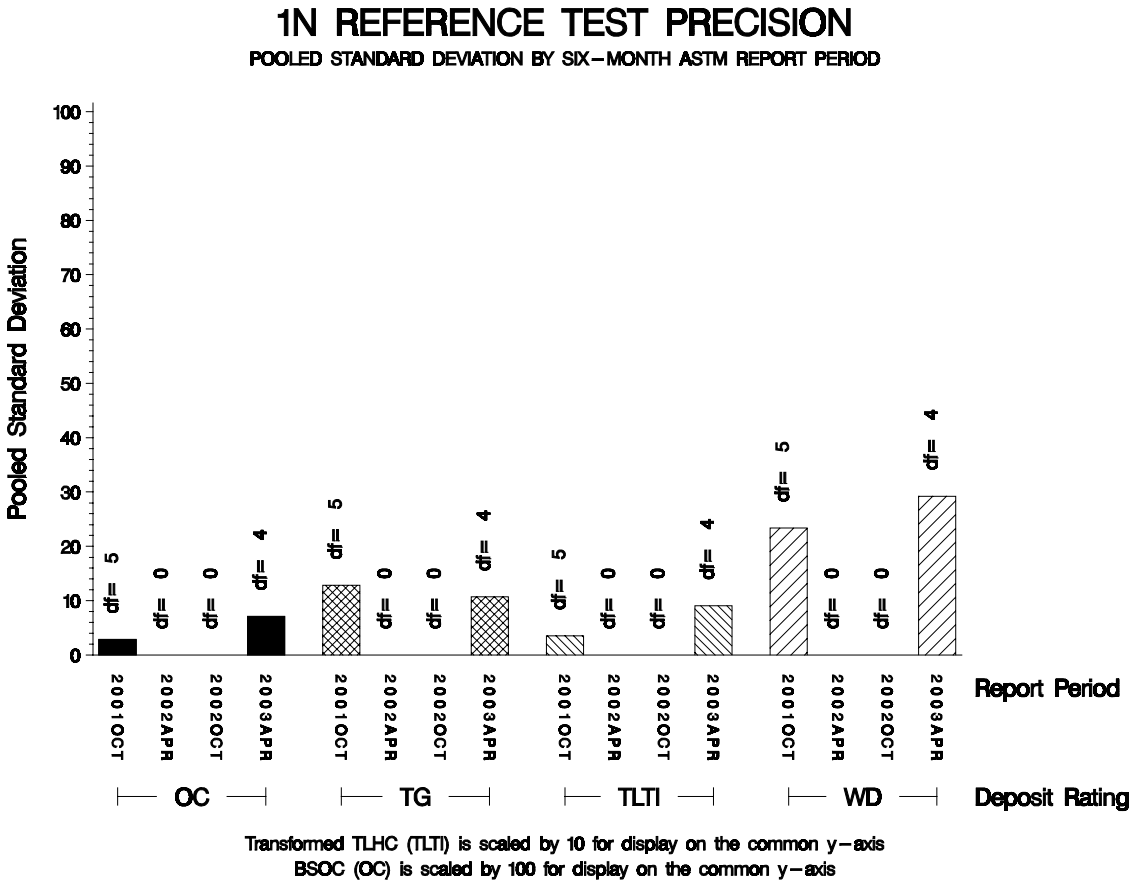
BSOC:

The average BSOC Yi reported this period was –0.336 or, computing a delta using the test target standard deviation of 0.045 for oil 1004-1 gives 0.02g/kW mild. The LTMS/Cusum plot for BSOC is shown below.



POOLED S:

Shown below is a bar chart comparing the pooled s values for the 1N test parameters over the last four report periods. Please note that the values for TLHC have been multiplied by 10 and the values for BSOC have been multiplied by 100 to allow these parameters to be shown on the same plot as the other parameters.



STATUS OF REFERENCE OIL SUPPLY:

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

		@ TMC	
Oil	Cans @ Labs	Cans	Gallons
809-1	9	301	3016
810-2	3	360	3605
811-1	11	2	20
811-2	0	168	1682
1004-1	6	0	0
1004-2	0	3	38
1004-3	7	151	1511
Total	36	985	9872

* 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 1N test area. 809-1 is used in several other test areas; 810-2 and 811-*x* are used in the 1K test area; and 1004-*x* is used in several of the other diesel test areas.

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

Effective Date	Info Letter	
19910710	2	INDUSTRY CORRECTION FACTORS FOR CANDIDATE TESTING
19910927	1	INFORMATION LETTER 1 - REWRITTEN PROCEDURE
19911015	3	COOLING SYSTEM MODIFICATION
19911015	3	COOLANT BYPASS VALVE
19911015	3	CYLINDER LINER WEAR MEASUREMENT DEVICE
19911015	3	TEST FUEL NAME CHANGE
19911015	3	REPORT FORMS
19920601	4	CLOSED COOLING SYSTEM
19920601	4	PISTON PACKAGING FOR REFEREE RATING
19920601	4	MINERAL FREE WATER - DEFINITION
19920601	5	FLUSHING CART FLOW DIAGRAM
19920731	6	TEMPERATURE PRESSURE AND SPEED STANDARD CALIBRATION TRACEABILITY
19920731	6	HUMIDITY MONITORING SYSTEM
19921015	7	FUEL INJECTION PUMP TIMING USING THE BUBBLE METHOD
19921015	7	PISTON RATER CALIBRATION
19921015	7	OIL SAMPLING FREQUENCY FOR USED OIL ANALYSIS
19930324	8	INTERNAL ENGINE PAINT AND SUPPLIER
19930629		FIRST USE OF 1004
19930702	9	CATERPILLAR BRAND COOLANT
19930708	10	PROCEDURE DISCLAIMER
19930708	10	CYLINDER HEAD COOLANT PASSAGE CLEANING
19930708	10	CRANKCASE PRESSURE INCREASE DURING BLOWBY MEASUREMENT
19930708	10	ACCEPTABLE CYLINDER HEAD/JUG ASSEMBLIES
19930708	10	RING GAP MEASUREMENT - FEELER GAUGES/TAPER GAUGE
19930708	10	PISTON POSITION DURING DOWNTIME
19930708	10	OIL CONSUMPTION CALCULATIONS
19930708	10	OIL CONSUMPTION CALCULATION AFTER SHUTDOWN
19930708	10	MISSING OR BAD TEST DATA
19930708	10	TYPOGRAPHICAL ERROR IN TABLE A12
19940101		1Y3555 DEADLINE
19940101	11	TEST RUN NUMBERING
19940101	11	PISTON PHOTOGRAPHS
19940101	11	USE OF AN ALIGNMENT FIXTURE IN P-TUBE AIMING
19940101	11	LOCATION OF LINER SURFACE FINISH MEASUREMENTS
19940101	11	LOCATION OF LINER BORE DIAMETER MEASUREMENTS
19940101	11	ENGINE ROTATION SPEED DURING FLUSHING
19940101	11	ACCEPTABLE CYLINDER LINER PART NUMBERS
19940101	11	CALIBRATION FREQUENCY
19940102		CATERPILLAR COOLANT DEADLINE
19940129		START OF EXCLUSIVE USE OF 1004-X OILS
19940205		FIRST USE OF 1004-1
19940226		LAST USE OF 1004
19940301	12	OUTLIERS AS A TEST VALIDITY CRITERIA
19940301	12	INSTRUMENTATION CALIBRATION TOLERANCES AND TIME CONSTANTS
19940316	13	FUEL DILUTION AS AN OPERATIONAL VALIDITY CRITERION
19950401		FIRST LTMS TEST
19950605		811-1 RETURN TO SYSTEM
19950811		FIRST USE OF 1004-2
19950918		809-1 RETURN TO SYSTEM
19960510	96-1	1K/1N DATA DICTIONARY AND REPORT FORMS (VERSION=19960304)
19960913	96-2	BETA TESTED 1K/1N DATA DICTIONARY AND REPORT FORMS (VERSION=19960913)
19961025		FIRST 810-X DISCRIMINATION RUN
19970320	97-1	USE OF LOW SULFUR FUEL FOR THE 1N TEST
19970320	97-1	ADDITION OF END OF TEST OIL CONSUMPTION (EOTOC) AS A REPORTED PARAMETER
19970320	97-1	ENGINE PARTS WARRANTY CLAIM PROCEDURE CHANGE
19970320	97-1	LTMS REQUIREMENTS FOR CALIBRATION
19970320	97-1	CLARIFICATION OF SPECIFICATION FOR HUMIDITY CALIBRATION
19970320	97-1	CLARIFICATION OF WHEN REFEREE RATINGS ARE REQUIRED
19970320	97-1	ADDITION OF DATA DICTIONARY AND REPORT FORMS TO THE PROCEDURE
19970320	97-1	TEST REPORTING DEADLINES
19970320	97-1	EXAMPLES FOR SEVERAL OF THE REPORT FORMS
19980101	98-1	FUEL SUPPLIER NAME CHANGE
19980101	98-1	FUEL SAMPLING REQUIREMENTS
19980101	98-1	REVISED ENGINE PARTS WARRANTY PROCEDURE & FORM
19980101	98-1	810-2 DISCRIMINATION RUNS RETURNED TO LTMS/CAL RUNS, CAL PD = 1YR
19980828	98-2	RATING WORKSHEET ADDED TO TEST REPORT AS FORM 4A
19981111	98-3	ADDED AREAS FOR CLEAN TO RATING SHEETS 5 & 5A
19990419	99-1	TEST STAND INSTRUMENTATION CALIBRATION REQUIREMENTS
19990419	99-1	COOLANT SYSTEM FLUSHING REQUIREMENTS
19990419	99-1	UPDATED INTAKE AIR FILTER 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
19990419	99-1	TIME ZONE FOR USE IN EOT REPORTING
19990419	99-1	EDITORIAL
20000101	00-1	810-X RUNS WILL OCCUR VOLUNTARILY ONCE PER YEAR

TIMELINE (continued):

Effective Date	Info Letter	
20020321	02-1	1K/1N DATA DICTIONARY AND REPORT FORMS (VERSION=20020107)

RATING:
During this report period, one 1N test required re-rating. The demerits were widely divergent between the lab and first referee. A second referee more closely matched the test lab's rating. The first referee rater had an opportunity to again examine the piston and found several mistakes on his original rating. The second referee rating was used for the test report. The table below summarizes the re-rates for this report period:

Rating Re-rate Summary

Total number of re-rates requested	1
Number of tests where lab rating was changed	0
Number of tests where referee rating was changed	1
Number of tests where no changes were made	0

LAB VISITS:
No 1N lab visits were completed during this 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: QJ1421LS01, QL1821LS02, QL3021LS10, and RB0121LS20.

SUMMARY

- Severity for TGF, TLHC, and BSOC remained within the action limits for the duration of this period. The slightly severe WDN results reported are a contrast to the mild results seen over the past several periods.

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

SDP/sdp/astm0403.doc/mem03-042.sdp.doc
c: J. L. Zalar
F. M. Farber
Abdul Cassim
Single Cylinder Diesel Surveillance Panel
ftp://ftp.astmtmc.cmu.edu/docs/diesel/scote/semiannualreports/1n-04-2003.pdf

Distribution: internet