



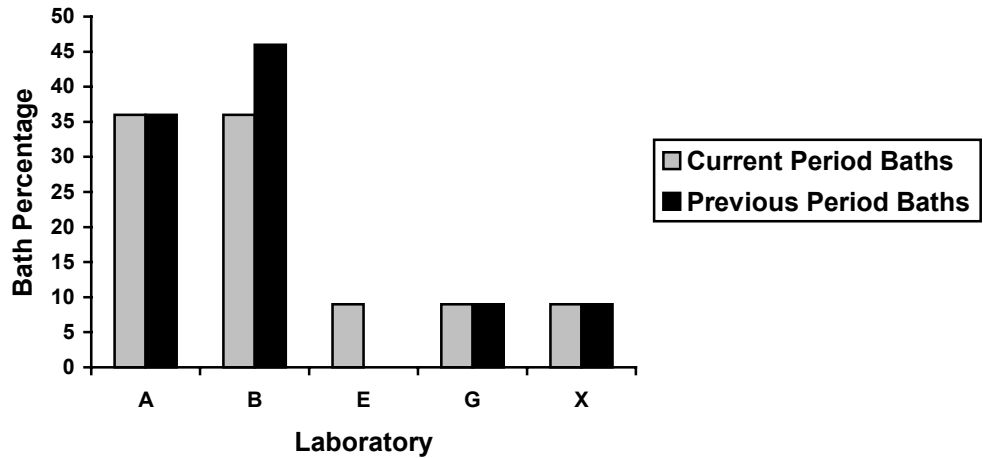
Test Monitoring Center

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MEMORANDUM: 03-032
DATE: April 10, 2003
TO: Jerry Wang, Chairman, CBT Surveillance Panel
FROM: Jeff Clark
SUBJECT: High Temperature Corrosion Bench Test Status from October 1, 2002 through March 31, 2003

A total of 137 High Temperature Corrosion Bench Test results from eleven baths in five labs were reported to the TMC during the period from October 1, 2002 through March 31, 2003. The following chart shows the distribution by laboratory.

Laboratory/Bath Distribution



The following summarizes the status of the reference oil tests reported to the TMC:

	TMC Validity Codes	No. of Tests
Operationally and Statistically Acceptable	AC	127
Failed Acceptance Criteria	OC	7
Operationally Invalid, Lab Judgement	LC	1
Aborted	XC	2
Total		137

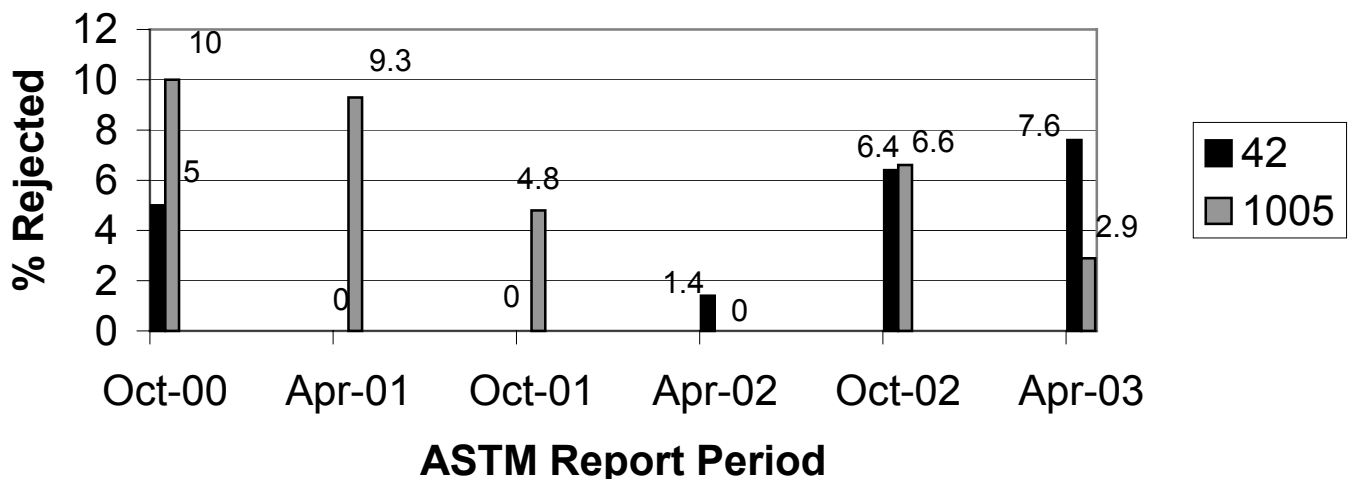
One test was operationally invalid due to running 72 hours too long. Two tests were aborted due to poor temperature control.

The following tabulates the statistically unacceptable tests:

Reason	Number of Tests
Severe Copper, Mild Lead (Reference oil 42)	3
Severe Copper (Reference oil 42)	1
Severe Copper (Reference oil 1005)	1
Mild Copper, Severe Lead (Reference oil 1005)	1
Mild Lead (Reference oil 42)	1

A total of 66 operationally valid results were run on reference oil 42 of which 5 failed (7.6% fail rate). A total of 68 operationally valid results were run on reference oil 1005 of which 2 failed (2.9% fail rate). The following presents the fail rate for this period with the fail rates of previous periods, by reference oil:

Comparison of Rejection Rates, by Oil, for This Period Versus Previous Periods



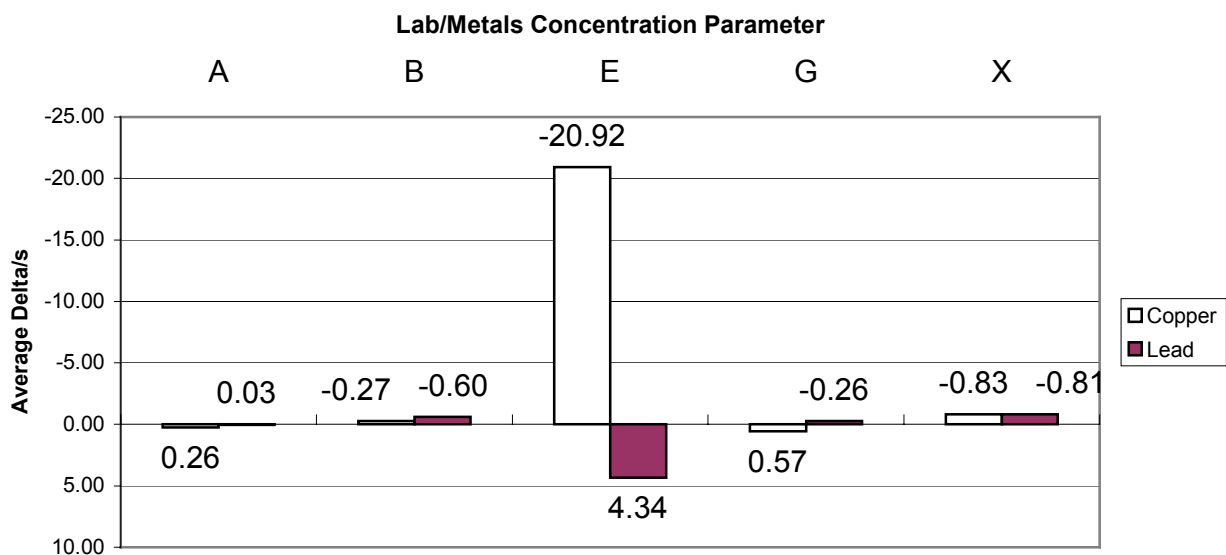
Industry Severity and Precision

The current severity for the change in metals concentration parameters on all operationally valid tests, for the current and previous periods, is tabulated below.

Period	n	Δ Cu Mean Δ/s	Δ Pb Mean Δ/s
10/1/02 through 3/31/03	134	0.01	-0.26
4/1/02 through 9/30/02	124	0.30	0.22
10/1/01 through 3/31/02	137	0.02	-0.05
4/1/01 through 10/1/01	116	0.28	-0.26
10/1/00 through 3/31/01	87	0.02	-0.29

Figures 1 and 2 plot the Summation delta/s from target for both change in copper and change in lead, respectively. Figure 1 shows copper change to be on target for the period. Figure 2 shows lead change to be mild for the period. Laboratory severity for both reference oils 1005 and 42 is depicted below. Note that Lab E is new to the industry and to date has completed only one test, which had unusual results for both copper and lead.

Average Delta/s By Lab, TMC Oils 42 & 1005



Industry Severity by Reference Oil

The industry performance (severity and precision) for reference oil 42, comparing the current period with the previous ASTM report periods, is tabulated below. Values in parentheses are in transformed (natural log) units.

Period	n	Δ Cu mean	Δ Cu S	Δ Cu Mean Δ/s	Δ Pb mean	Δ Pb s	Δ Pb Mean Δ/s
10/1/02 to 3/31/03	66	26.8 (3.289)	(0.478)	0.11	100.1	19.53	-0.32
4/1/02 to 9/30/02	63	34.7 (3.546)	(0.492)	0.55	114.0	15.69	0.26
10/1/01 to 3/31/02	71	26.4 (3.274)	(0.376)	0.09	108.9	16.75	0.05
4/1/01 to 9/30/01	54	38.0 (3.638)	(0.293)	0.24	102.0	15.56	-0.25
10/1/00 to 3/31/01	44	25.4 (3.236)	(0.263)	0.02	97.75	12.51	-0.42

The industry performance (severity and precision) for reference oil 1005, comparing the current period with the previous ASTM report periods, is tabulated below. Values in parentheses are in transformed (natural log) units.

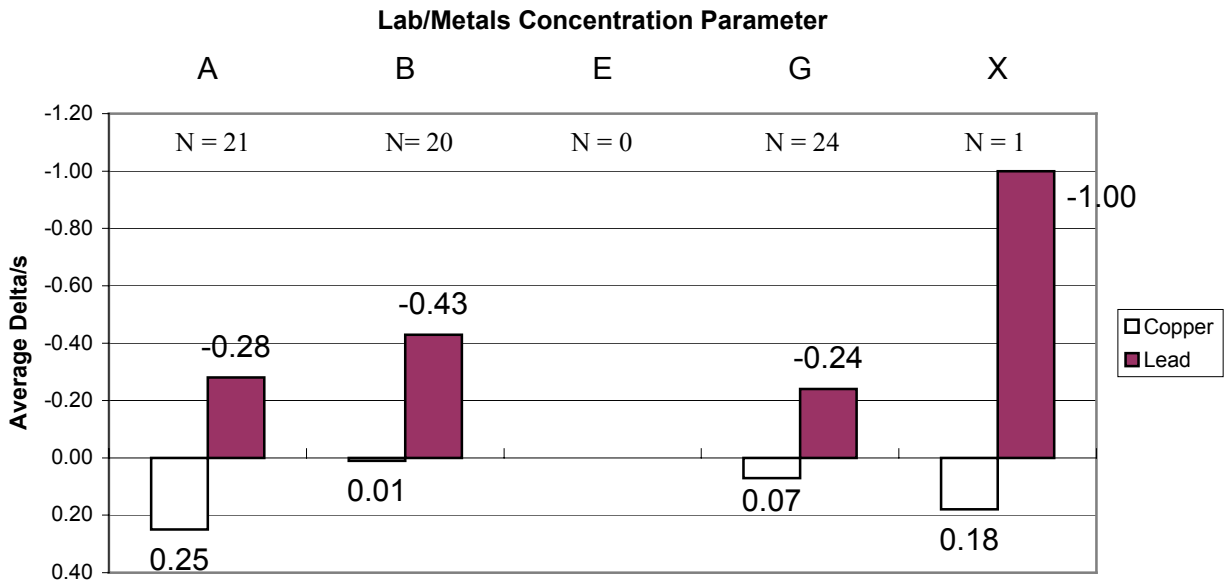
Period	n	Δ Cu mean	Δ Cu S	Δ Cu Mean Δ/s	Δ Pb mean	Δ Pb s	Δ Pb Mean Δ/s
10/1/02 to 3/31/03	68	9.4 (2.243)	(0.497)	-0.09	29.6	11.3	-0.20
4/1/02 to 9/30/02	61	9.6 (2.262)	(0.164)	0.04	34.4	15.0	0.17
10/1/01 to 3/31/02	66	9.5 (2.248)	(0.154)	-0.05	30.3	9.3	-0.15
4/1/01 to 9/30/01	62	10.0 (2.300)	(0.151)	0.31	28.8	10.1	-0.27
10/1/00 to 3/31/01	43	9.6 (2.258)	(0.190)	0.02	30.3	33.5	-0.15

Precision for copper on both oils shows some degradation compared to historical levels. The 1005 degradation is likely due to the single test at Lab E. Precision for lead shows some degradation for oil 42 and is within historical levels for oil 1005. For this period, copper was slightly severe for oil 42 and on target for oil 1005. Lead was mild for both oils.

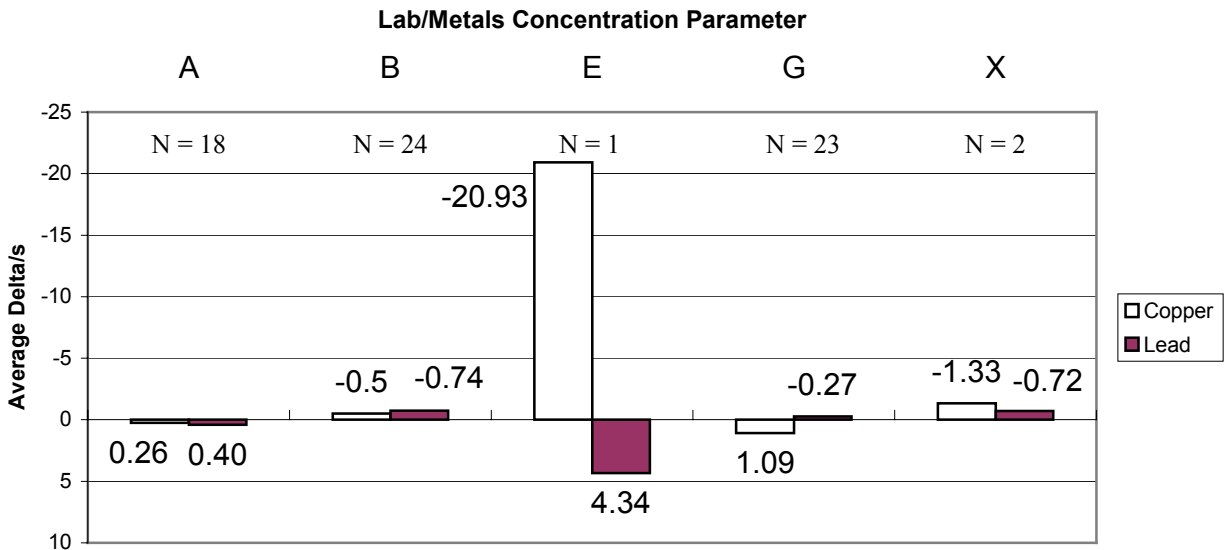
Laboratory Severity by Oil

Severity, for each oil, is plotted by laboratory on the following page.

Average Delta/s By Lab, TMC Oil 42



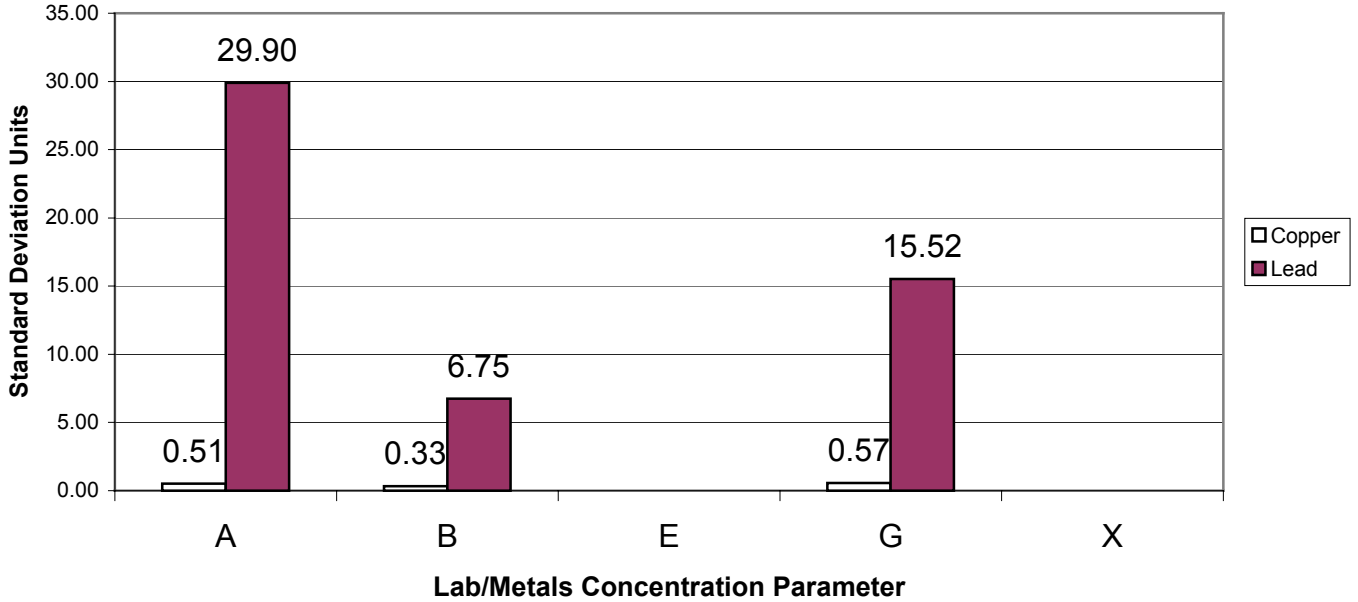
Average Delta/s By Lab, TMC Oil 1005



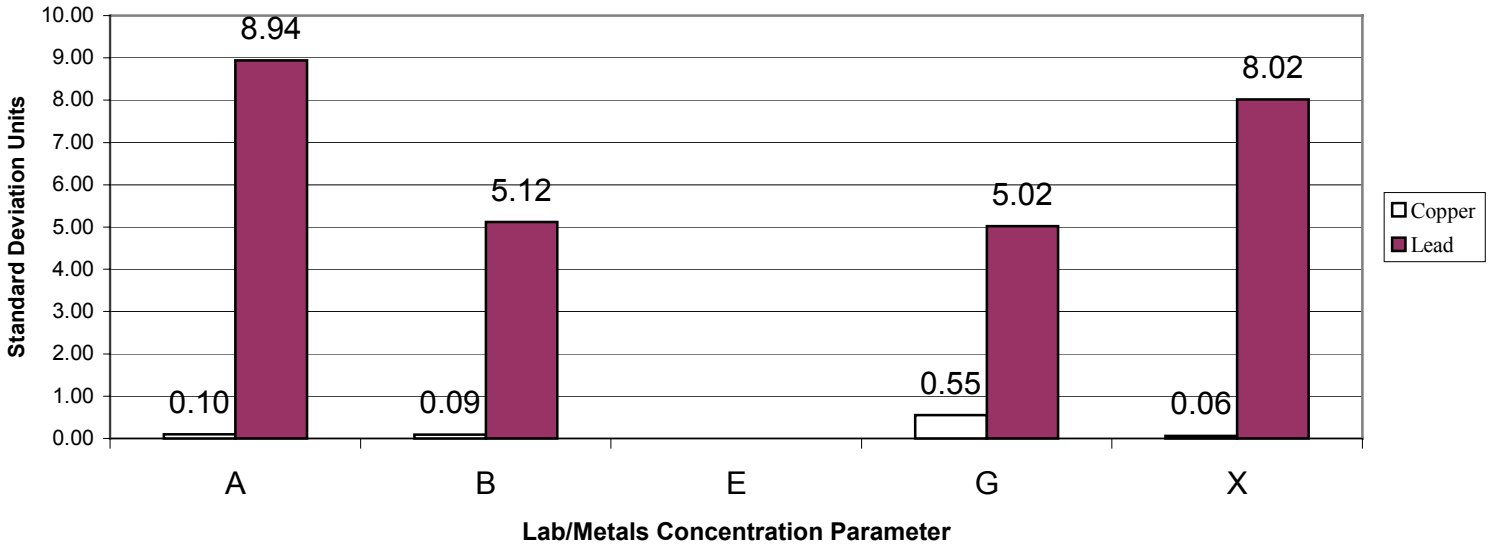
The charts show that all labs are mild on lead for oil 42. Labs A and X are severe for copper on oil 42, while labs B and G are on target. For oil 1005, labs B and X are mild and lab A is severe. Lab G is severe for copper and mild for lead. No commentary is offered regarding lab E other than it has not yet successfully calibrated, and its only result is extremely unusual.

The following plots show the precision for this period, by lab and oil.

Precision (s) By Lab, TMC Oil 42



Precision Estimates (s) By Lab, TMC Oil 1005



Copper standard deviations were calculated in transformed (natural log, ln) units. For oil 42, lead variability was higher at lab A and lower at lab B. Copper variability was lower at lab B also. For oil 1005, lead variability was higher at labs A and X. For copper, variability was higher at lab G. No precision estimate was available for both oils at lab E and for oil 42 at lab X due to an n size of 1.

Reference Oil Supply

Reference oil quantities available at the laboratories and TMC, as well as estimated life of these oils, are tabulated below.

Oil	TMC Inventory, in gallons	TMC Inventory, in tests	Laboratory Inventory, in tests	Estimated life
42	4.74	152	35	1.3 years
1005	69.4	2220	35	16+ years

Information Letters

No information letters were issued this report period.

Additional Information

The HTCBT database is available from the TMC's website. If you are uncertain of how to access this data, contact the TMC.

JAC/jac/mem03-032.jac.doc

c: HTCBT Surveillance Panel
J. L. Zalar
F. M. Farber

<ftp://ftp.astmtmc.cmu.edu/docs/bench/htcvt/semiannualreports/htcvt-04-2003.pdf>

Distribution: Email

Figure 1

HIGH TEMP CBT INDUSTRY OPERATIONALLY VALID DATA

COPPER CHANGE (ppm)

CUSUM Severity Analysis

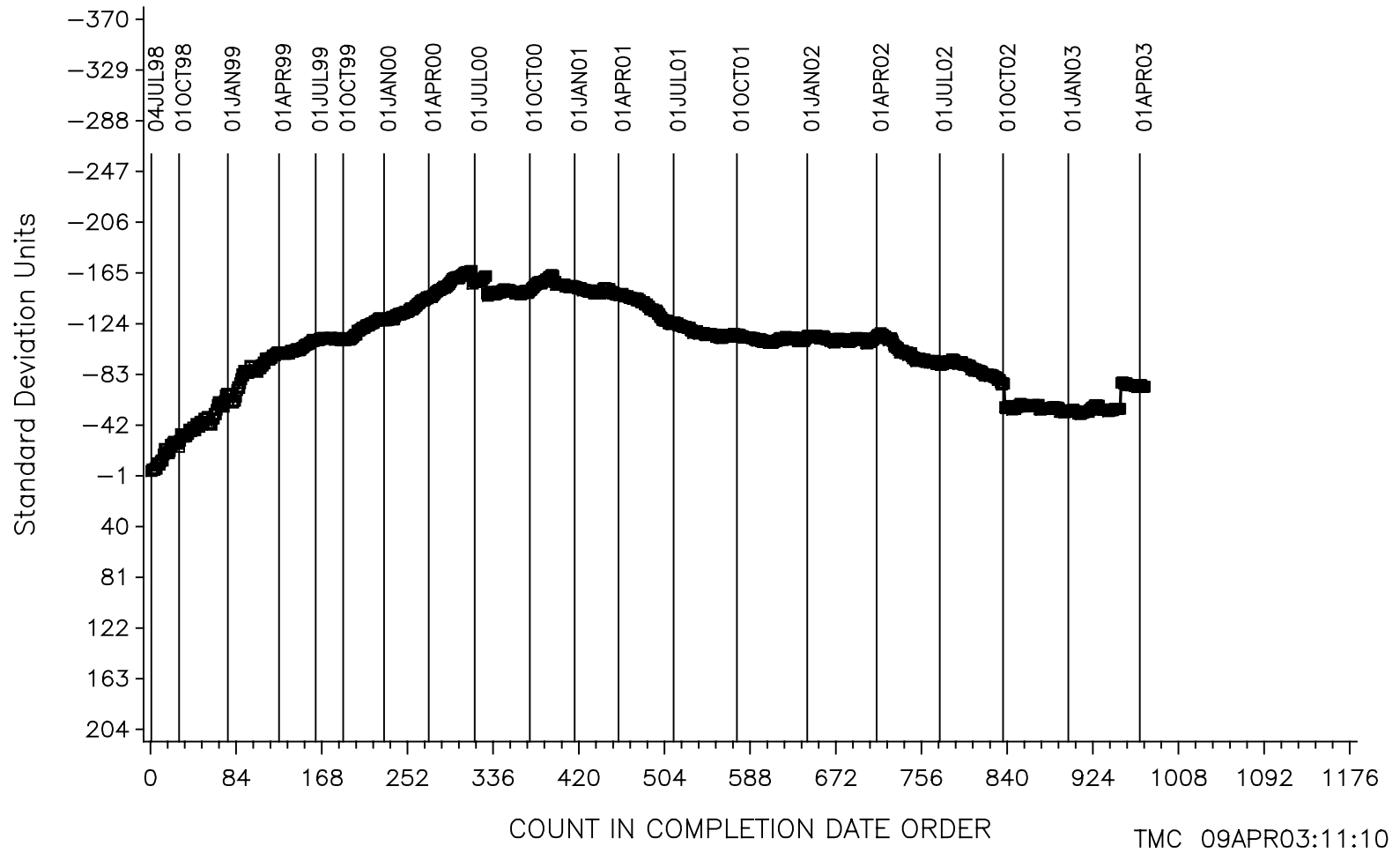
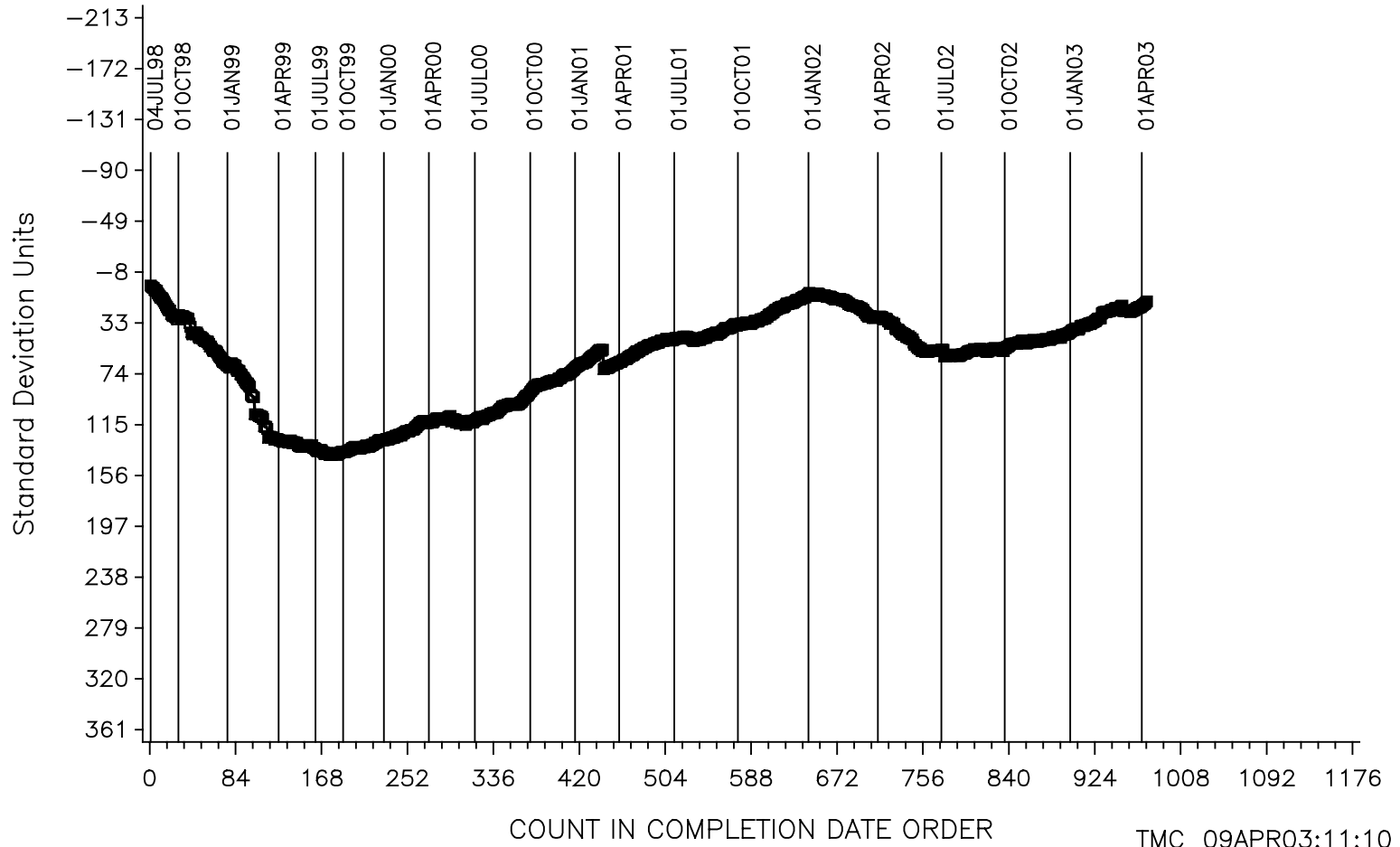


Figure 2

HIGH TEMP CBT INDUSTRY OPERATIONALLY VALID DATA

LEAD CHANGE (ppm)

CUSUM Severity Analysis



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