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MEMORANDUM: 04-036

DATE: April 27, 2004

TO   Claire Whitton, Chairman, OSCT Surveillance Panel

FROM: Donald Lind

SUBJECT: OSCT Reference Oil Test Results from October 1, 2003 through March 31, 2004

A total of 88 OSCT reference oil results from 2 laboratories were reported during the period October 1, 2003 through March 31, 2004.

The following table summarizes the status of the reference oil test results reported to the TMC this report period:

Elastomer Type		TMC Validity	No. of Test Oil Results
Fluoroelastomer	Operationally and Statistically Acceptable	AC	32
	Statistically Unacceptable	OC	0
	Operationally Invalid	LC	0
	Aborted	XC	0
	Information Only	NN	0
Polyacrylate	Operationally and Statistically Acceptable	AC	30
	Statistically Unacceptable	OC	0
	Operationally Invalid	LC	0
	Aborted	XC	2
	Information Only	NN	0
Nitrile	Information Only	NI	24
	Operationally Invalid	LI	0
	Information Only	NN	0
	Aborted	XI	0
	TOTAL		88

The following chart shows the laboratory bath distribution for data reported during this report period:

Laboratory/Bath Distribution
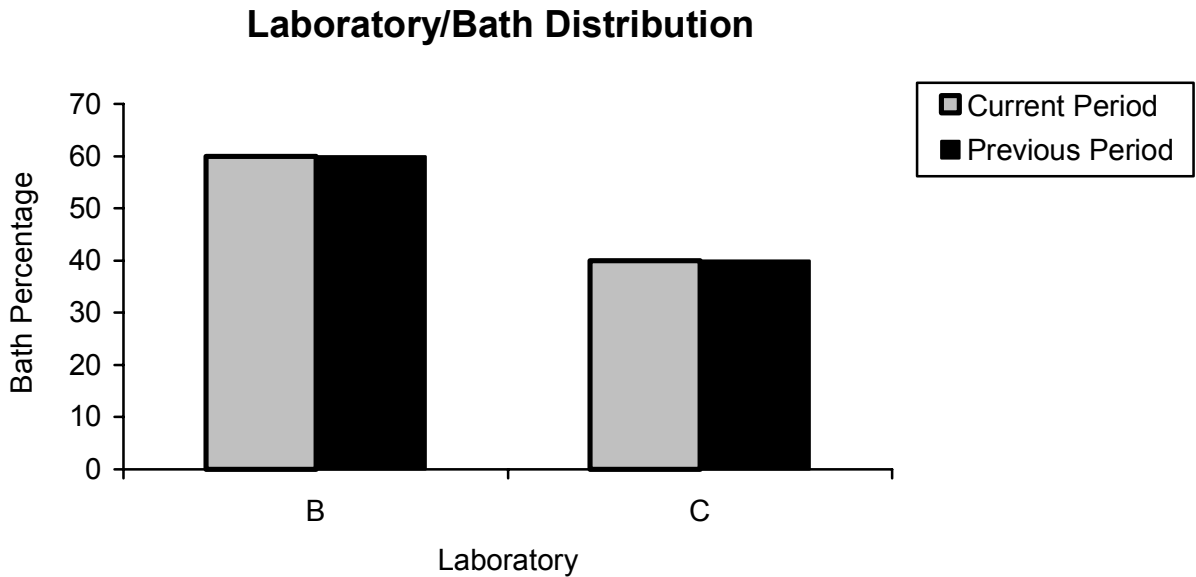
Attempted calibration tests are depicted graphically below by report period:
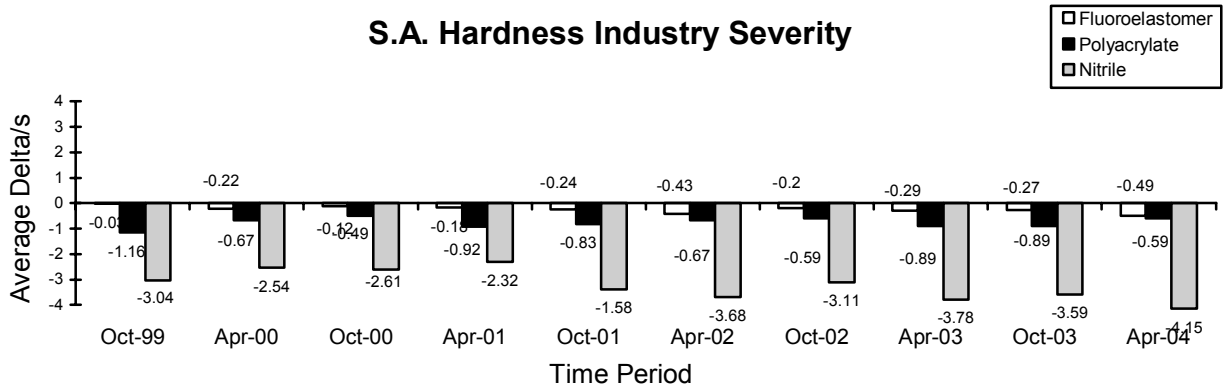
Calibration Attempt Summary
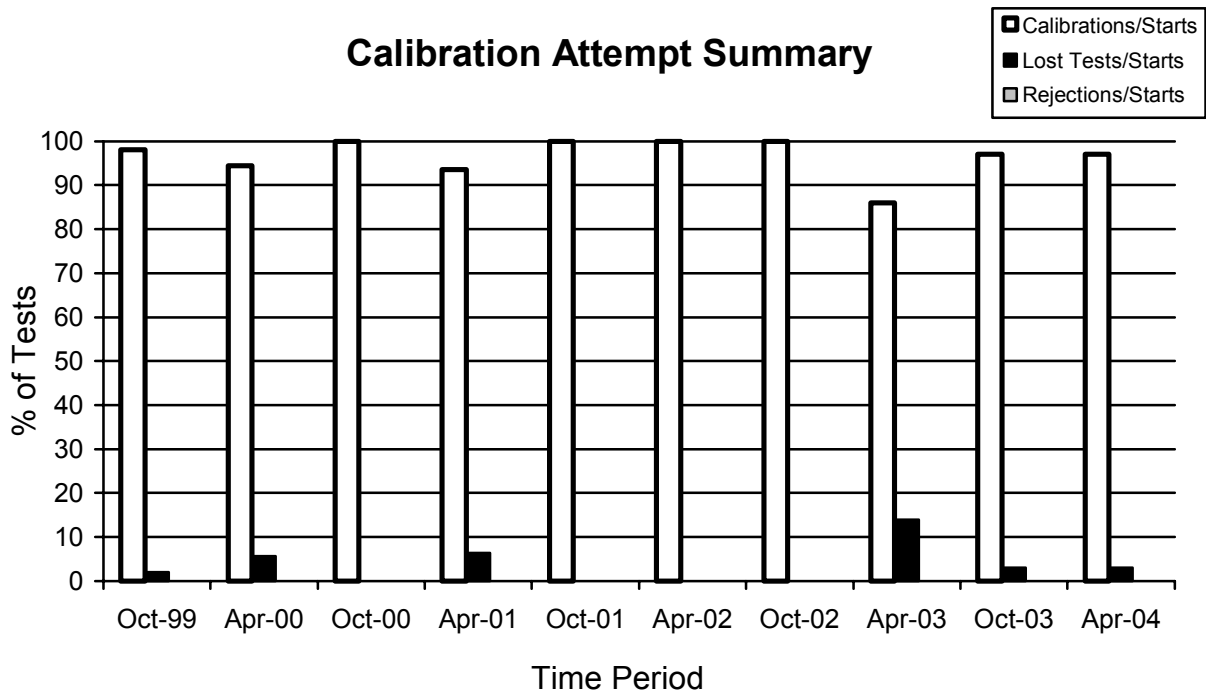
The calibration per start, lost test per start, and the rejected per start rates all remained the same when compared to the last report period. All rates are well within historical levels.
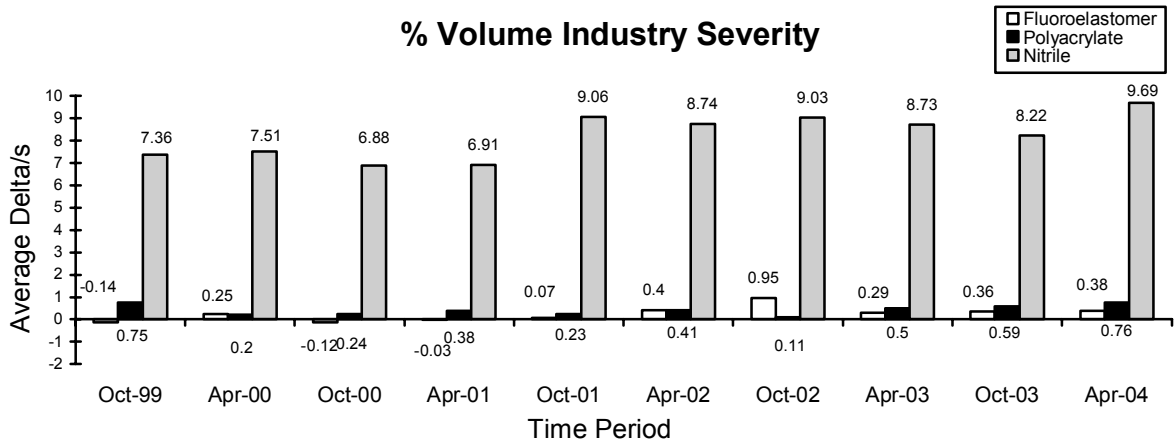
INDUSTRY TEST SEVERITY

Percent elongation industry mean delta/s bar charts for each elastomer material are shown below by report period. Percent elongation for all three materials (fluoroelastomer, nitrile and polyacrylate) trended mild for the period.

% Elongation Industry Severity

Legend: ☐ Fluoroelastomer, ■ Polyacrylate, ☐ Nitrile

Time Period	Fluoroelastomer	Polyacrylate	Nitrile
Oct-99	1.86	1.01	0.59
Apr-00	1.12	0.21	0.67
Oct-00	0.87	0.29	0.51
Apr-01	1.27	0.83	0.57
Oct-01	1.34	0.52	0.95
Apr-02	0.42	0.28	0.95
Oct-02	0.37		1.2
Apr-03	0.19	0.82	0.98
Oct-03	0.26	0.61	1.04
Apr-04	0.55	0.71	1.18
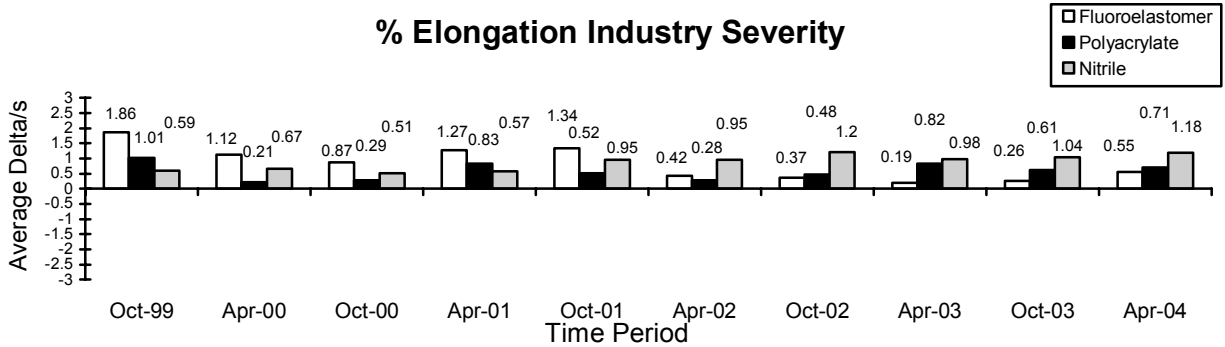
S.A. hardness industry mean delta/s bar charts for each elastomer material are shown below by report period. S.A. hardness for all three materials (fluoroelastomer, nitrile and polyacrylate) trended mild for the period.

S.A. Hardness Industry Severity

Legend: ☐ Fluoroelastomer, ■ Polyacrylate, ☐ Nitrile

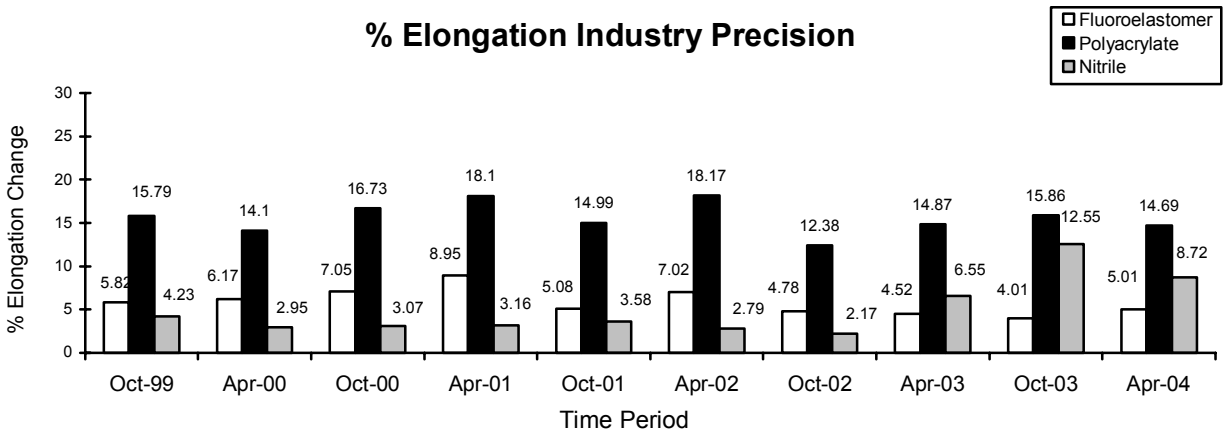| Time Period	Fluoroelastomer	Polyacrylate	Nitrile
Oct-99	-0.0?	-1.16	-3.04
Apr-00	-0.22	-0.67	-2.54
Oct-00	-0.12	-0.49	-2.61
Apr-01	-0.18	-0.92	-2.32
Oct-01	-0.24	-0.83	-1.58
Apr-02	-0.43	-0.67	-3.68
Oct-02	-0.2	-0.59	-3.11
Apr-03	-0.29	-0.89	-3.78
Oct-03	-0.27	-0.89	-3.59
Apr-04	-0.49	-0.59	-4.15

Percent volume industry mean delta/s bar charts for each elastomer material are shown below by report period. Nitrile materials were significantly mild of target. Fluoroelastomer and polyacrylate materials trended slightly mild this period. Both labs experienced mild results with the nitrile elastomer as much as 14 standard deviations from target.

% Volume Industry Severity

Legend: ☐ Fluoroelastomer, ■ Polyacrylate, ☐ Nitrile

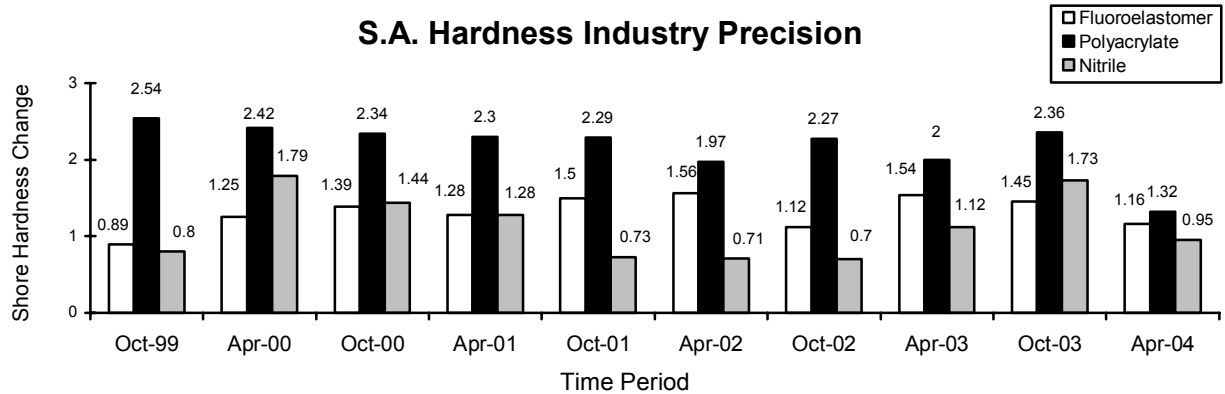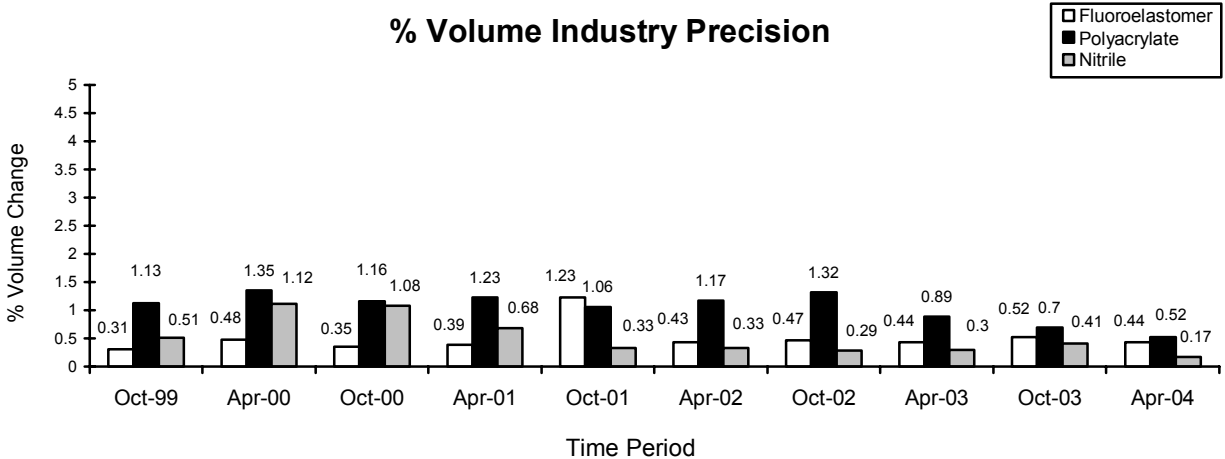| Time Period	Fluoroelastomer	Polyacrylate	Nitrile
Oct-99	-0.14	0.75	7.36
Apr-00	0.25	0.2	7.51
Oct-00	-0.12	0.24	6.88
Apr-01	-0.03	0.38	6.91
Oct-01	0.07	0.23	9.06
Apr-02	0.4	0.41	8.74
Oct-02	0.95	0.11	9.03
Apr-03	0.29	0.5	8.73
Oct-03	0.36	0.59	8.22
Apr-04	0.38	0.76	9.69

INDUSTRY TEST PRECISION

Percent elongation industry precision estimates for elastomer material are shown below by report period. Precision for polyacrylate and nitrile have improved with respect to the previous period. Precision for fluoroelastomer has degraded slightly with respect to the previous period. Precision for all three elastomers compares well with historical levels.

% Elongation Industry Precision

Legend: ☐ Fluoroelastomer ■ Polyacrylate ☐ Nitrile

Y-axis: % Elongation Change (0 to 30)
X-axis: Time Period

Time Period	Fluoroelastomer	Polyacrylate	Nitrile
Oct-99	5.82	15.79	4.23
Apr-00	6.17	14.1	2.95
Oct-00	7.05	16.73	3.07
Apr-01	8.95	18.1	3.16
Oct-01	5.08	14.99	3.58
Apr-02	7.02	18.17	2.79
Oct-02	4.78	12.38	2.17
Apr-03	4.52	14.87	6.55
Oct-03	4.01	15.86	12.55
Apr-04	5.01	14.69	8.72

Shore hardness industry precision estimates for elastomer material are shown below by report period. Precision for polyacrylate, fluoroelastomer, and nitrile elastomers have improved with respect to the previous period and compares well with respect to historical levels.

S.A. Hardness Industry Precision

Legend: ☐ Fluoroelastomer ■ Polyacrylate ☐ Nitrile

Y-axis: Shore Hardness Change (0 to 3)
X-axis: Time Period

Time Period	Fluoroelastomer	Polyacrylate	Nitrile
Oct-99	0.89	2.54	0.8
Apr-00	1.25	2.42	1.79
Oct-00	1.39	2.34	1.44
Apr-01	1.28	2.3	1.28
Oct-01	1.5	2.29	0.73
Apr-02	1.56	1.97	0.71
Oct-02	1.12	2.27	0.7
Apr-03	1.54	2	1.12
Oct-03	1.45	2.36	1.73
Apr-04	1.16	1.32	0.95

Percent volume industry precision estimates for elastomer materials are shown below by report period. Precision for polyacrylate, fluoroelastomer and nitrile elastomers have improved slightly with respect to the previous period and compares well with respect to historical levels.

% Volume Industry Precision

Legend: □ Fluoroelastomer ■ Polyacrylate □ Nitrile

Y-axis: % Volume Change (0 to 5)

X-axis: Time Period

Time Period	Fluoroelastomer	Polyacrylate	Nitrile
Oct-99	0.31	1.13	0.51
Apr-00	0.48	1.35	1.12
Oct-00	0.35	1.16	1.08
Apr-01	0.39	1.23	0.68
Oct-01	1.23	1.06	0.33
Apr-02	0.43	1.17	0.33
Oct-02	0.47	1.32	0.29
Apr-03	0.44	0.89	0.3
Oct-03	0.52	0.7	0.41
Apr-04	0.44	0.52	0.17

REFERENCE OILS

The following table quantifies each reference oil by the number of reference oil containers remaining at the TMC and each laboratory. Each reference oil container has 750 ml (0.2 gallons) of oil.

LAB	160-1	161-1	162
B	12	16	11
C	11	17	6
TMC	775	378	25

INFORMATION LETTERS

There were no information letters issued during this report period.

TMC ACTIVITIES

There were two lab visits conducted this report period with only one discrepancy to report. One lab was only allowing one hour for the elastomers to warm to the Specified temperature. Section 8.2 of D 5662 states that you must allow three hours for the elastomers to warm to the specified temperature of $23 \pm 2°C$.

DML/dml

Attachments

c: OSCT Surveillance Panel
J. L. Zalar, TMC
F. M. Farber, TMC
ftp://ftp.astmtmc.cmu.edu/docs/gears/osct/semiannualreports/osct-04-2004.pdf

Distribution: Email