



Test Monitoring Center

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

MEMORANDUM: 05-096

DATE: November 18, 2005

TO: Becky Grinfield,
Chairman, Engine Oil Elastomer Compatibility Surveillance Panel

FROM: Scott Parke

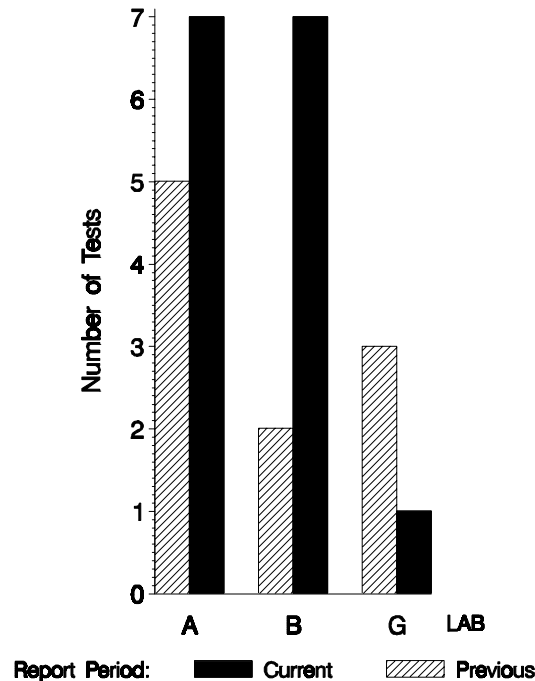
SUBJECT: EOEC Testing from April 1, 2005 through September 30, 2005

A total of seventy-eight EOEC tests were reported to the Test Monitoring Center during the period from April 1, 2005 through September 30, 2005. The data from these tests is shown on page 5. Following is a summary of testing activity this period.

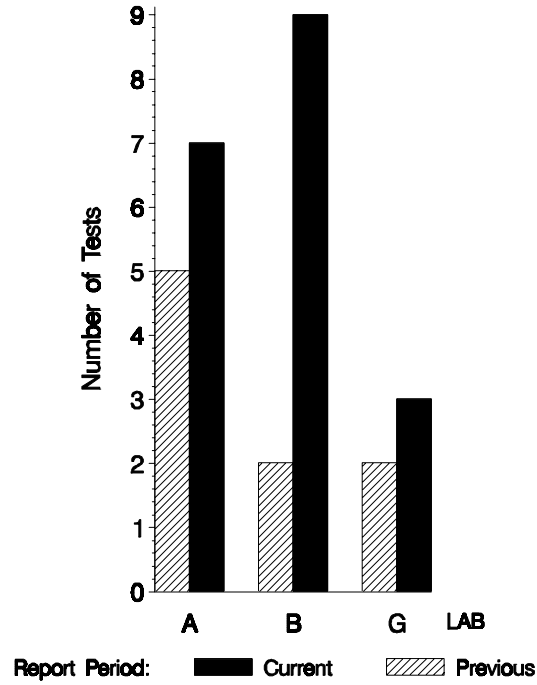
	Reporting Data
Number of Labs	3

Tests reported this period were distributed as shown below:

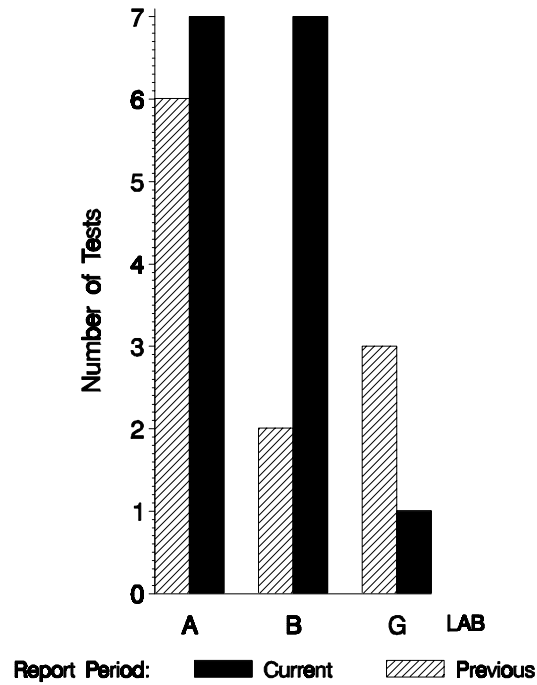
NUMBER OF FLUROELASTOMER TESTS REPORTED BY LAB AND REPORT PERIOD



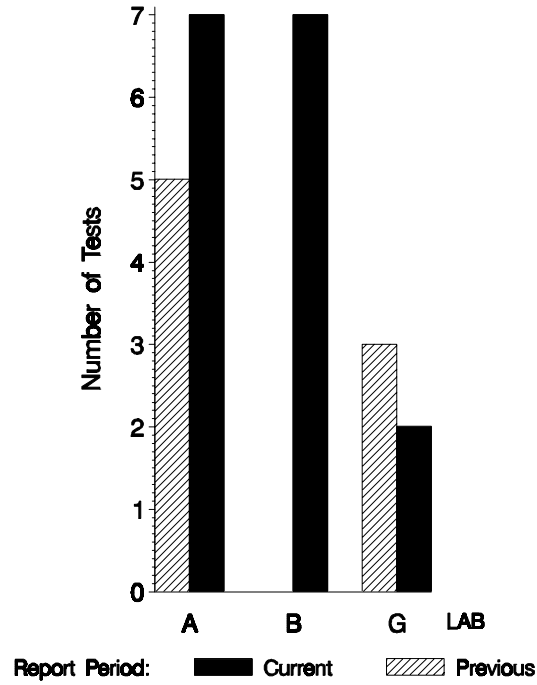
**NUMBER OF NITRILE TESTS
REPORTED BY LAB AND REPORT PERIOD**



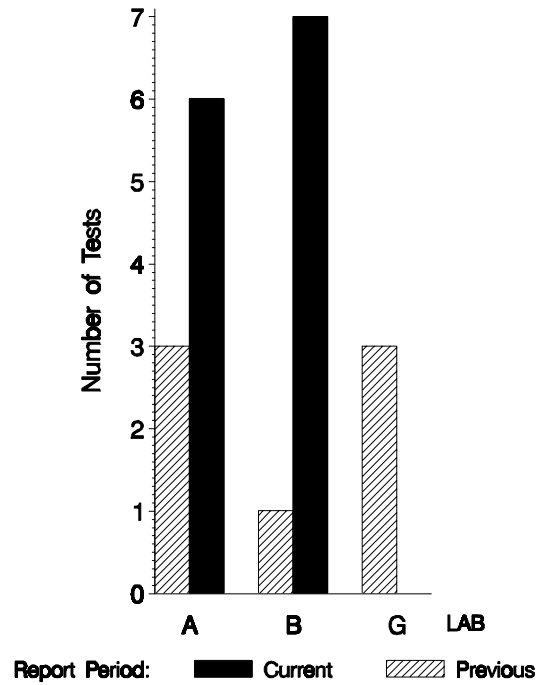
**NUMBER OF POLYACRYLATE TESTS
REPORTED BY LAB AND REPORT PERIOD**



**NUMBER OF SILICONE TESTS
REPORTED BY LAB AND REPORT PERIOD**



**NUMBER OF VAMAC TESTS
REPORTED BY LAB AND REPORT PERIOD**

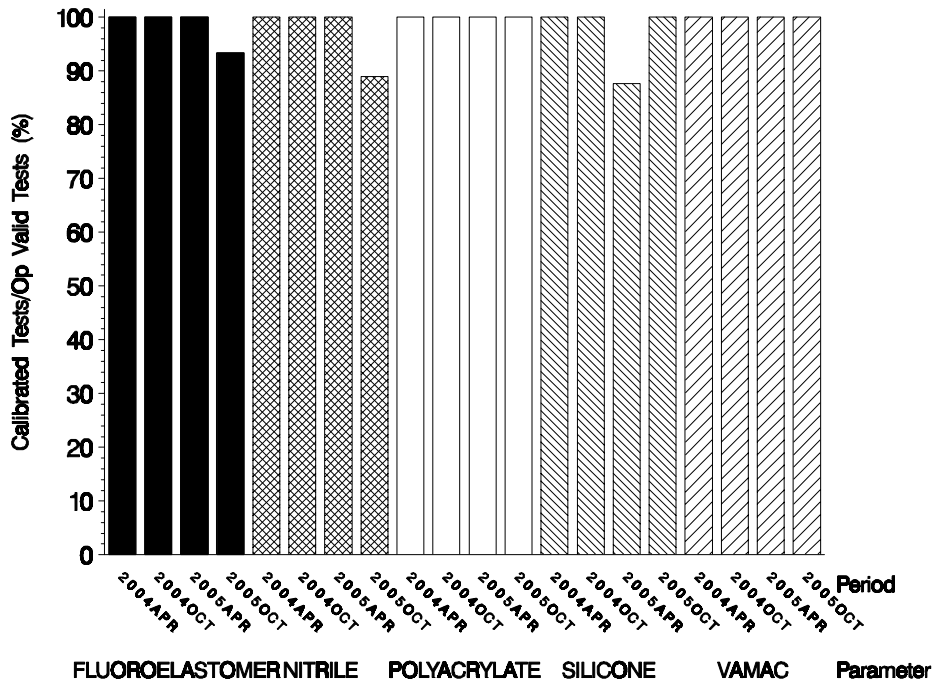


Test Distribution by Oil and Validity

Totals

		Fluoroelastomer	Nitrile	Polyacrylate	Silicone	VAMAC	Last Period	This Period
Accepted for Calibration	AC	14	16	15	16	13	43	74
Rejected Mild	OC	1	0	0	0	0	1	1
Rejected Severe	OC	0	2	0	0	0	0	2
Operationally Invalid (lab)	LC	0	0	0	0	0	1	0
Operationally Invalid (lab/TMC)	RC	0	0	0	0	0	0	0
Aborted Calibration	XC	0	1	0	0	0	0	1
Total		15	19	15	16	13	45	78

**OPERATIONALLY VALID TESTS
MEETING ACCEPTANCE CRITERIA**



The above chart shows the percentage of accepted operationally valid tests. This period one fluoroelastomer and two nitrile tests failed to meet the acceptance criteria.

Lost Tests per Start by Lab and Elastomer Type

Lab	Fluoroelastomer			Nitrile			Polyacrylate			Silicone			VAMAC			Total		
	Lost	Starts	%	Lost	Starts	%	Lost	Starts	%	Lost	Starts	%	Lost	Starts	%	Lost	Starts	%
A	0	7	0	0	7	0	0	7	0	0	7	0	0	6	0	0	34	0
B	0	7	0	1	9	11	0	7	0	0	7	0	0	7	0	1	37	3
G	0	1	0	0	3	0	0	1	0	0	2	0	0	0	0	0	7	0
Total	0	15	0	1	19	5	0	15	0	0	16	0	0	13	0	1	78	1

Lost tests are those that were either aborted, rejected by lab, or operationally invalid.

Causes for Lost Tests

Lab	Cause	Elastomer					Validity				Loss Rate	
		Fluoroelastomer	Nitrile	Polycarbonate	Silicone	VAMAC	LC	RC	XC	Lost	Starts	%
B	Incorrect initial durometer reading.		●					●	1	37	3%	
	Lost	0	1	0	0	0	1	0	1			
	Starts	15	19	15	16	13	78	78	78			
	%	0%	5%	0%	0%	0%	33%	0%	1%			

Average Δ /s by Lab						
Elastomer	Lab	n	VOLCYI	HARDYI	TENSYI	ELONYI
Fluoroelastomer						
	A	7	-2.153	0.383	-0.183	-1.236
	B	7	-0.743	0.253	-0.062	-1.311
	Industry	15	-1.279	0.197	-0.019	-1.226
Nitrile						
	A	7	0.051	-0.136	-1.536	-0.312
	B	8	0.629	-0.237	0.030	0.790
	Industry	18	0.169	-0.473	-0.465	0.439
Polyacrylate						
	A	7	-1.306	-0.510	-0.117	0.339
	B	7	-0.758	-0.987	0.360	1.012
	Industry	15	-0.899	-0.754	0.077	0.624
Silicone						
	A	7	0.653	-0.604	-0.793	-0.513
	B	7	1.100	-0.604	0.398	0.560
	Industry	16	0.787	-0.396	-0.300	-0.103
VAMAC						
	A	6	-1.004	-0.607	1.287	-0.091
	Industry	13	-0.759	-0.391	1.095	-0.300

DATA FROM ALL OPERATIONALLY VALID TESTS REPORTED THIS PERIOD:
FLUOROELASTOMER

LTMS DATE	LAB	VOLC	HARD	TENS	ELON	VOLCYI	HARDYI	TENSYI	ELONYI
20050418	G	0.77	4	-61.6	-63.8	1.081	-1.500	1.436	-0.568
20050427	A	0.59	8	-69.8	-62.0	-0.135	0.318	-0.097	-0.368
20050429	B	0.60	9	-68.0	-72.4	-0.068	0.773	0.239	-1.525
20050516	B	0.60	8	-69.1	-65.5	-0.068	0.318	0.034	-0.758
20050530	A	-0.82	12	-70.9	-74.3	-9.662	2.136	-0.303	-1.736
20050602	B	0.32	7	-68.3	-64.5	-1.959	-0.136	0.183	-0.646
20050620	A	0.28	8	-70.1	-74.5	-2.230	0.318	-0.153	-1.759
20050701	B	0.60	8	-72.0	-69.0	-0.068	0.318	-0.508	-1.147
20050711	A	0.54	8	-70.9	-61.0	-0.473	0.318	-0.303	-0.257
20050721	A	0.44	8	-71.3	-69.7	-1.149	0.318	-0.378	-1.225
20050802	B	0.30	7	-70.8	-68.1	-2.095	-0.136	-0.284	-1.047
20050818	A	0.54	5	-65.6	-70.7	-0.473	-1.045	0.688	-1.336
20050824	B	0.62	8	-71.7	-77.3	0.068	0.318	-0.452	-2.070
20050907	A	0.47	8	-73.2	-76.4	-0.946	0.318	-0.733	-1.970
20050908	B	0.46	8	-67.4	-76.5	-1.014	0.318	0.351	-1.981

NITRILE

LTMS DATE	LAB	VOLC	HARD	TENS	ELON	VOLCYI	HARDYI	TENSYI	ELONYI
20050401	G	0.30	-2	-17.0	-41.6	-0.500	-2.073	1.428	1.378
20050418	G	-0.52	-3	-15.0	-30.1	-1.476	-2.638	1.701	3.089
20050425	A	0.45	-1	-31.7	-47.6	-0.321	-1.508	-0.577	0.485
20050429	B	0.82	-1	-21.0	-49.6	0.119	-1.508	0.883	0.187
20050510	G	0.41	0	-34.7	-55.6	-0.369	-0.944	-0.986	-0.705
20050512	B	1.08	2	-22.3	-42.7	0.429	0.186	0.705	1.214
20050526	A	0.97	2	-43.0	-55.9	0.298	0.186	-2.119	-0.750
20050607	B	3.49	1	-25.3	-44.0	3.298	-0.379	0.296	1.021
20050616	A	0.95	2	-40.3	-53.6	0.274	0.186	-1.750	-0.408
20050630	B	0.90	2	-28.1	-46.8	0.214	0.186	-0.086	0.604
20050705	B	1.12	1	-27.4	-42.6	0.476	-0.379	0.010	1.229
20050707	A	0.68	2	-34.8	-51.3	-0.048	0.186	-1.000	-0.065
20050719	A	0.73	3	-38.4	-51.3	0.012	0.751	-1.491	-0.065
20050803	B	0.73	2	-30.5	-46.5	0.012	0.186	-0.413	0.649
20050816	A	0.69	1	-42.3	-55.0	-0.036	-0.379	-2.023	-0.616
20050825	B	1.05	2	-32.6	-44.9	0.393	0.186	-0.700	0.887
20050905	A	0.87	1	-40.6	-56.0	0.179	-0.379	-1.791	-0.765
20050907	B	0.80	1	-30.8	-47.3	0.095	-0.379	-0.454	0.530

POLYACRYLATE

LTMS DATE	LAB	VOLC	HARD	TENS	ELON	VOLCYI	HARDYI	TENSYI	ELONYI
20050418	G	1.57	-3	-3.6	-19.0	0.961	-0.828	-0.552	-0.104
20050426	A	-0.08	-3	1.6	-15.8	-1.211	-0.828	0.095	0.254
20050429	B	1.37	-4	9.7	-10.7	0.697	-1.383	1.106	0.830
20050510	B	-0.14	-3	7.3	-12.8	-1.289	-0.828	0.808	0.594
20050527	A	-0.20	-2	1.0	-9.8	-1.368	-0.272	0.020	0.925
20050603	B	0.41	-4	3.6	1.2	-0.566	-1.383	0.345	2.152
20050617	A	0.02	-2	1.2	-12.2	-1.079	-0.272	0.045	0.657
20050701	B	0.16	-3	-2.0	-14.4	-0.895	-0.828	-0.347	0.408
20050708	A	-0.17	-2	-10.2	-22.3	-1.329	-0.272	-1.373	-0.473
20050720	A	-0.25	-3	-3.7	-18.0	-1.434	-0.828	-0.565	0.008
20050805	B	-0.09	-3	4.7	-8.7	-1.224	-0.828	0.475	1.045
20050817	A	-0.18	-3	7.9	-11.7	-1.342	-0.828	0.878	0.713
20050825	B	0.17	-3	1.1	-12.4	-0.882	-0.828	0.027	0.630
20050906	A	-0.21	-2	1.5	-15.5	-1.382	-0.272	0.082	0.287
20050907	B	-0.03	-3	1.7	-5.3	-1.145	-0.828	0.108	1.428

SILICONE

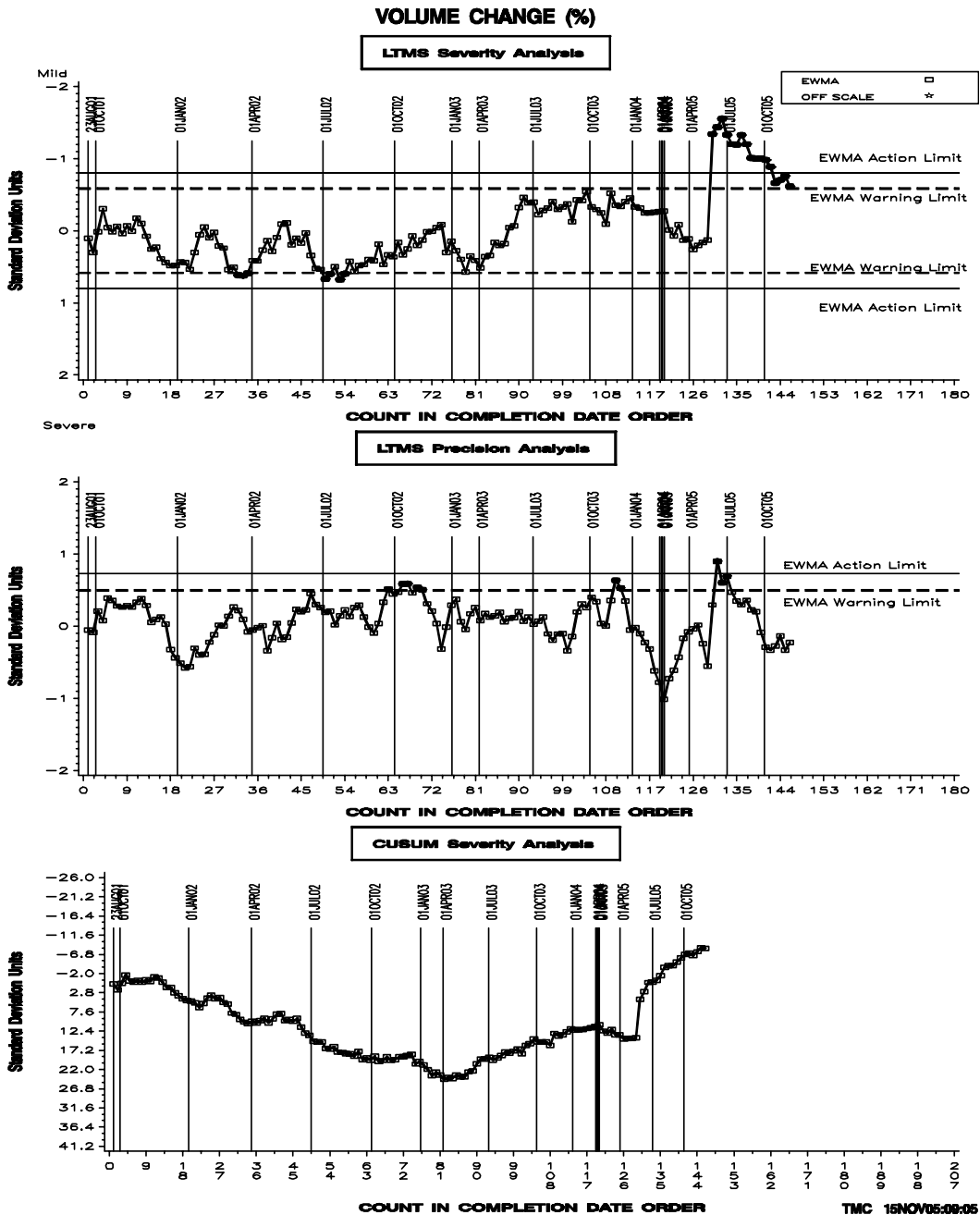
LTMS DATE	LAB	VOLC	HARD	TENS	ELON	VOLCYI	HARDYI	TENSYI	ELONYI
20050418	G	25.77	-16	-20.1	-29.6	-0.269	1.063	-1.522	-0.914
20050418	G	27.71	-16	-15.8	-30.6	0.586	1.063	-0.515	-1.058
20050428	A	26.41	-20	-13.1	-18.0	0.013	-0.604	0.117	0.755
20050429	B	28.13	-20	-18.4	-24.0	0.771	-0.604	-1.124	-0.108
20050511	B	29.35	-20	-8.9	-19.8	1.308	-0.604	1.101	0.496
20050531	A	28.00	-20	-16.1	-34.4	0.714	-0.604	-0.585	-1.604
20050603	B	28.97	-20	-9.9	-14.4	1.141	-0.604	0.867	1.273
20050621	A	26.78	-19	-17.8	-32.8	0.176	-0.187	-0.984	-1.374
20050705	B	28.83	-20	-12.5	-25.0	1.079	-0.604	0.258	-0.252
20050712	A	28.68	-21	-21.7	-39.0	1.013	-1.021	-1.897	-2.266
20050722	A	27.60	-20	-18.8	-31.7	0.537	-0.604	-1.218	-1.216
20050802	B	28.86	-20	-11.4	-20.1	1.093	-0.604	0.515	0.453
20050819	A	28.28	-20	-11.6	-12.6	0.837	-0.604	0.468	1.532
20050826	B	29.01	-20	-9.5	-11.0	1.159	-0.604	0.960	1.763
20050906	B	28.99	-20	-12.7	-21.2	1.150	-0.604	0.211	0.295
20050908	A	29.29	-20	-19.8	-19.2	1.282	-0.604	-1.452	0.583

VAMAC

LTMS DATE	LAB	VOLC	HARD	TENS	ELON	VOLCYI	HARDYI	TENSYI	ELONYI
20050428	B	16.30	-8	-23.0	-42.2	-0.650	0.095	0.081	-1.228
20050429	A	15.84	-9	-18.6	-31.3	-0.846	-0.958	0.732	-0.340
20050513	B	16.90	-8	-21.1	-37.2	-0.393	0.095	0.362	-0.821
20050531	A	14.85	-9	-13.3	-25.8	-1.269	-0.958	1.516	0.107
20050602	B	15.59	-8	-22.0	-41.5	-0.953	0.095	0.229	-1.171
20050622	A	15.76	-8	-14.0	-27.2	-0.880	0.095	1.413	-0.007
20050701	B	16.32	-8	-12.2	-28.8	-0.641	0.095	1.679	-0.137
20050713	A	15.14	-9	-14.5	-28.5	-1.145	-0.958	1.339	-0.112
20050722	A	16.02	-10	-14.3	-30.6	-0.769	-2.011	1.368	-0.283
20050804	B	16.02	-9	-13.8	-26.4	-0.769	-0.958	1.442	0.059
20050826	B	15.26	-8	-16.5	-32.9	-1.094	0.095	1.043	-0.471
20050909	A	15.21	-7	-14.4	-26.0	-1.115	1.147	1.354	0.091
20050915	B	19.35	-9	-12.2	-22.1	0.654	-0.958	1.679	0.409

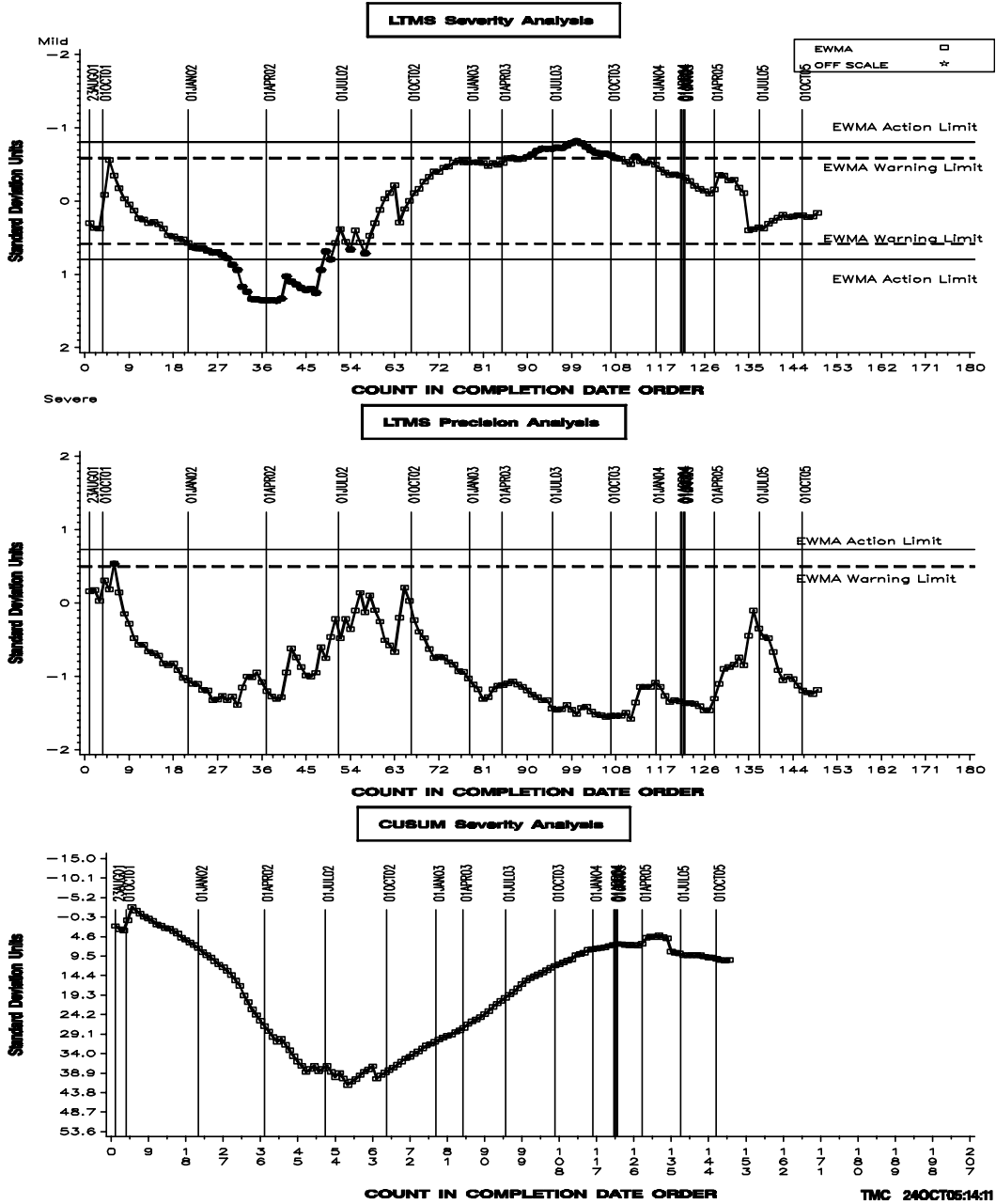
LTMS CONTROL CHARTS

EOEC – FLUROELASTOMER INDUSTRY OPERATIONALLY VALID DATA

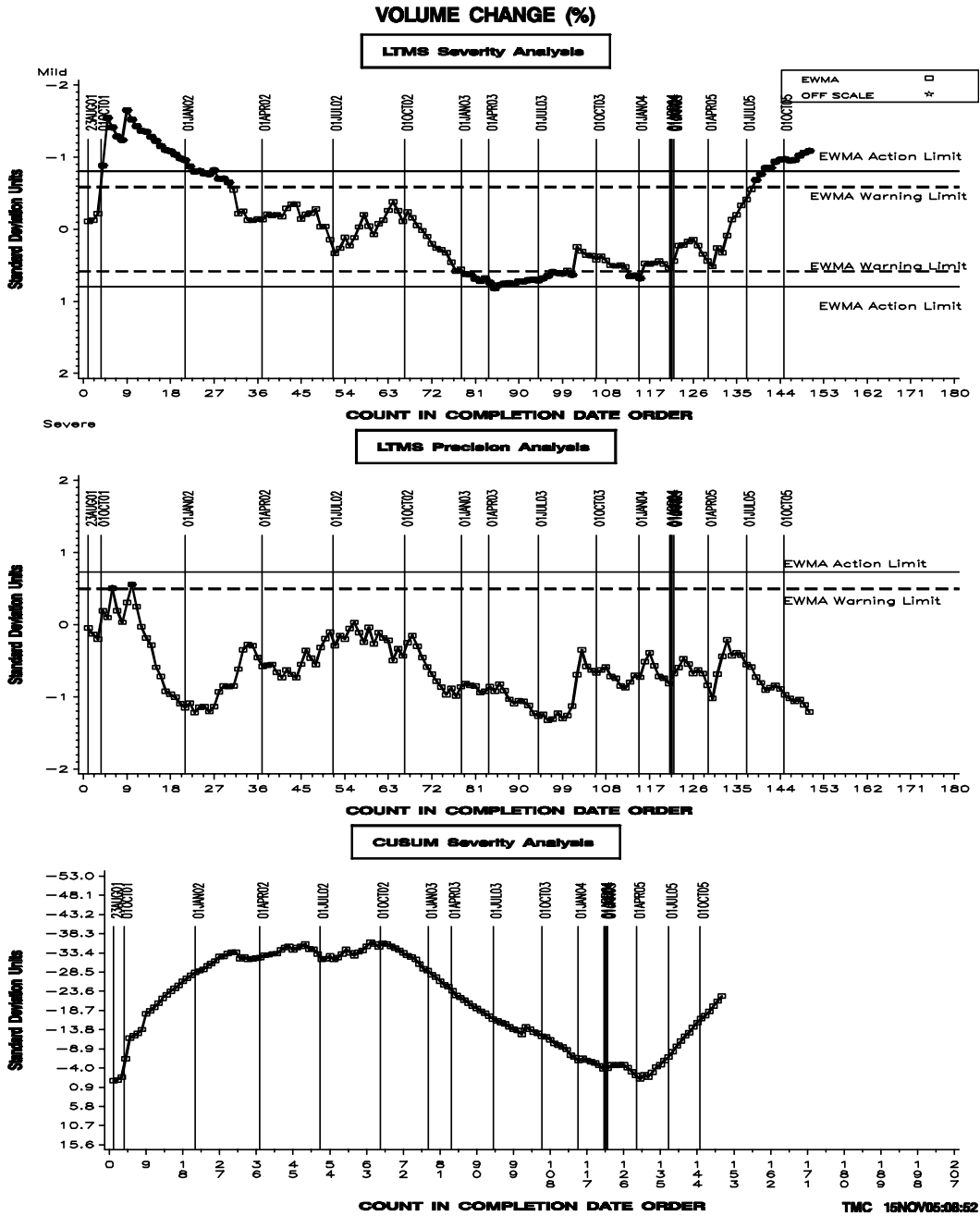


EOEC – NITRILE INDUSTRY OPERATIONALLY VALID DATA

REFERENCE VOLUME CHANGE (%)

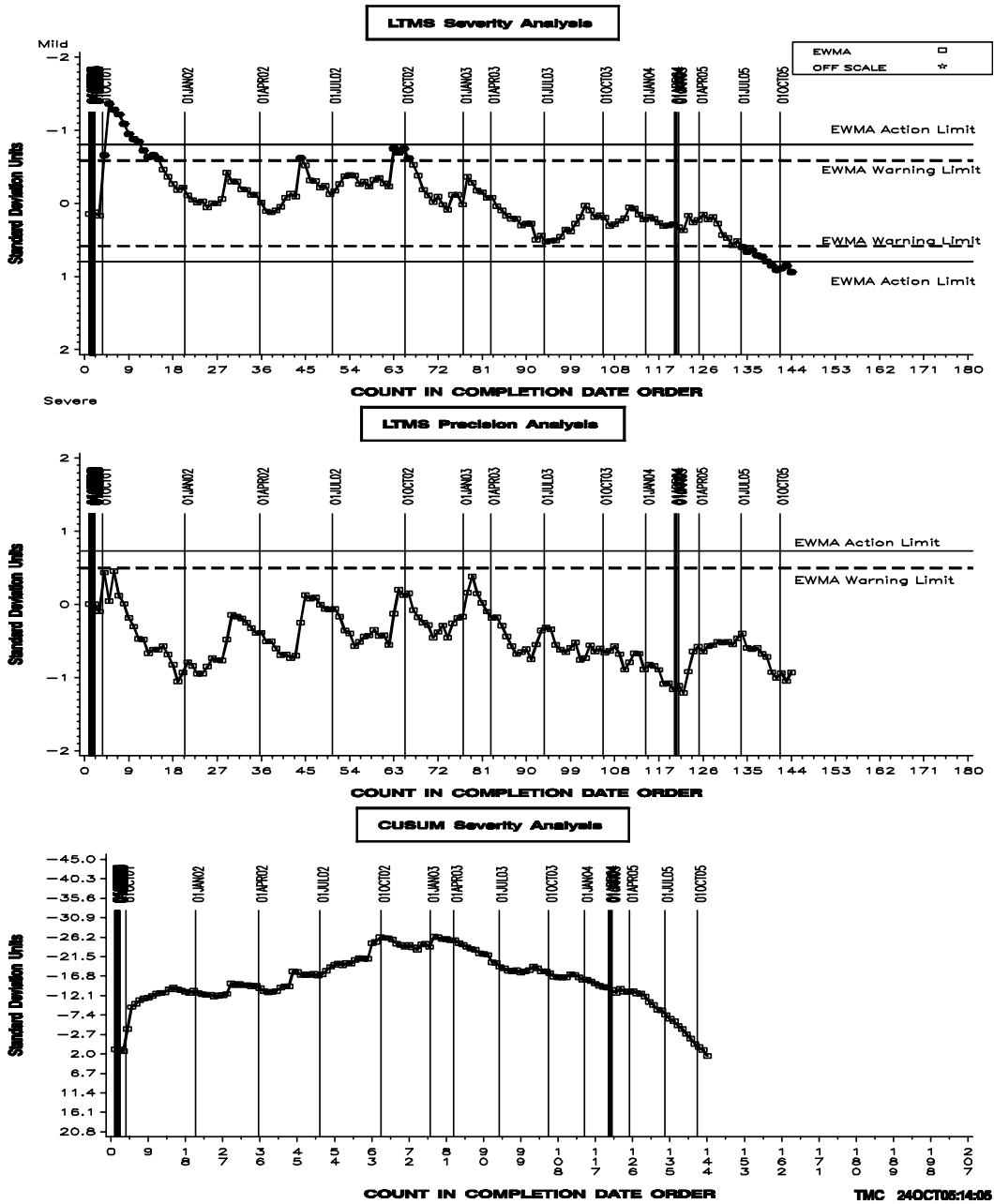


EOEC – POLYACRYLATE INDUSTRY OPERATIONALLY VALID DATA

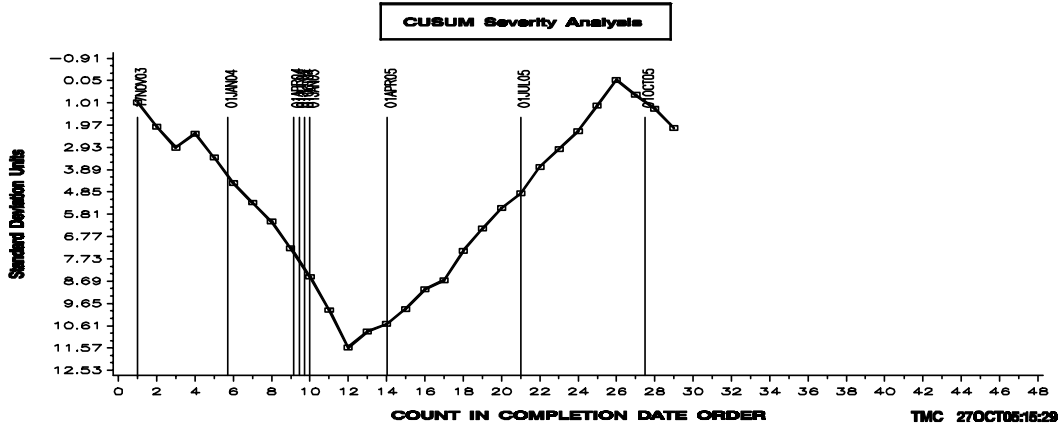
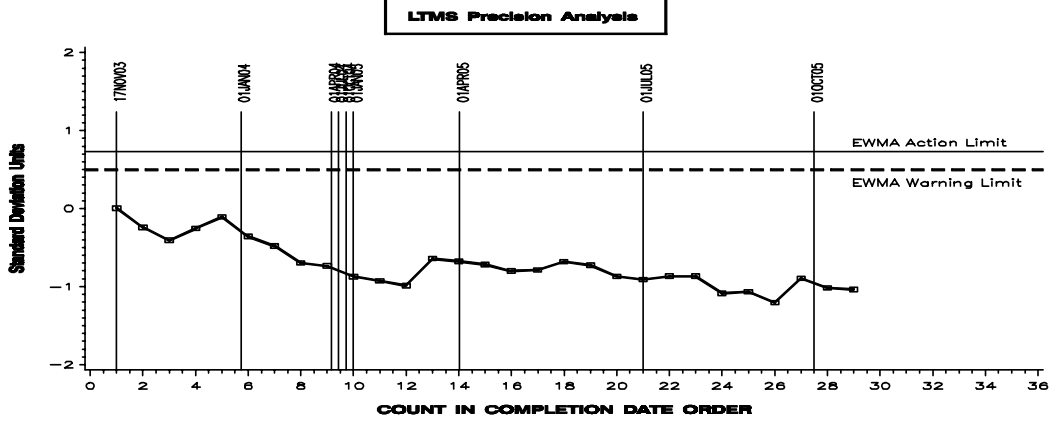
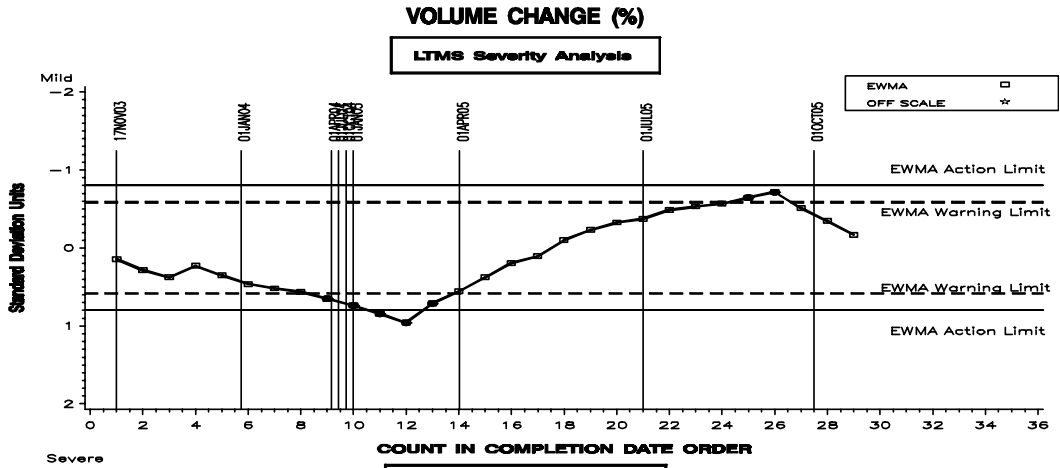


EOEC – SILICONE INDUSTRY OPERATIONALLY VALID DATA

REFERENCE SILICON VOLUME CHANGE AVERAGE

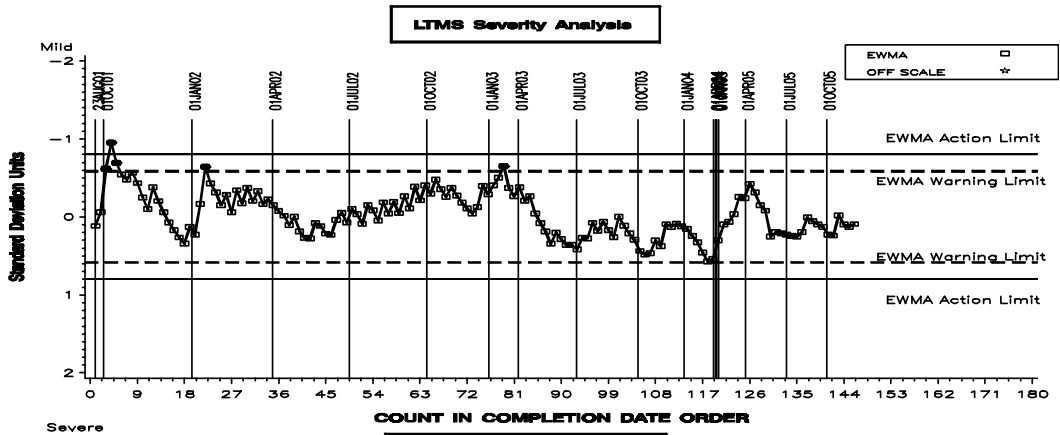


EOEC – VAMAC INDUSTRY OPERATIONALLY VALID DATA



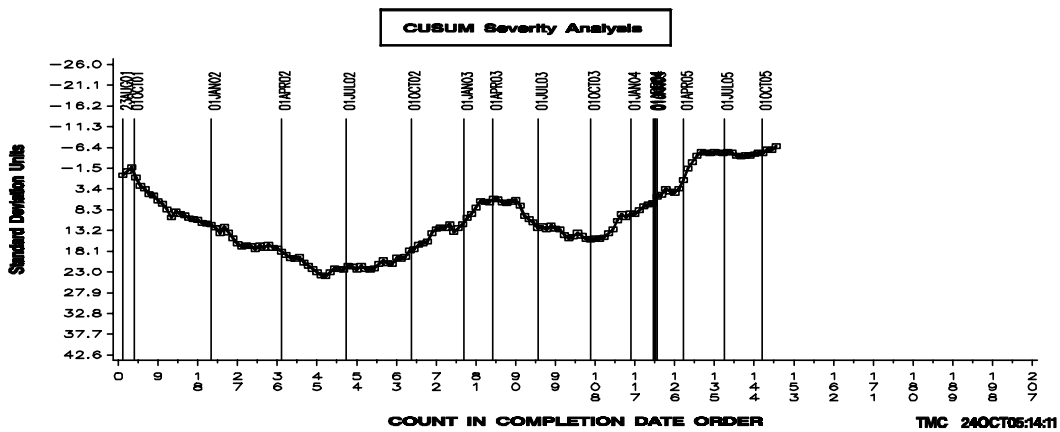
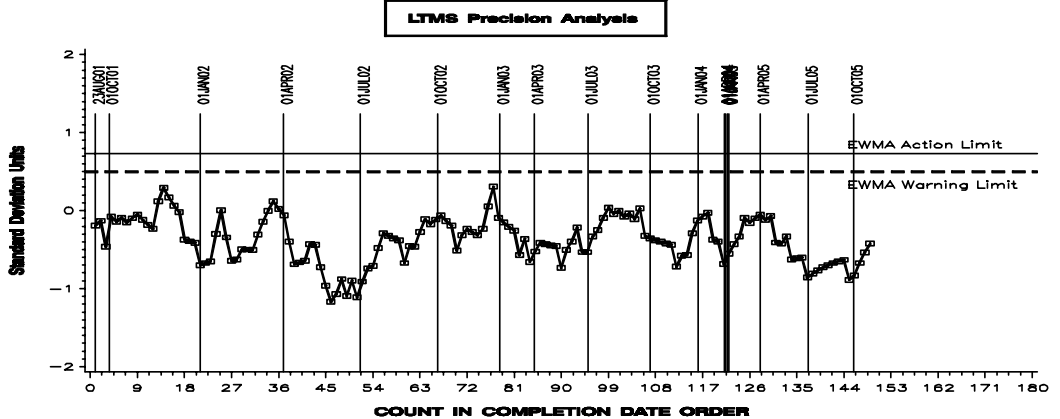
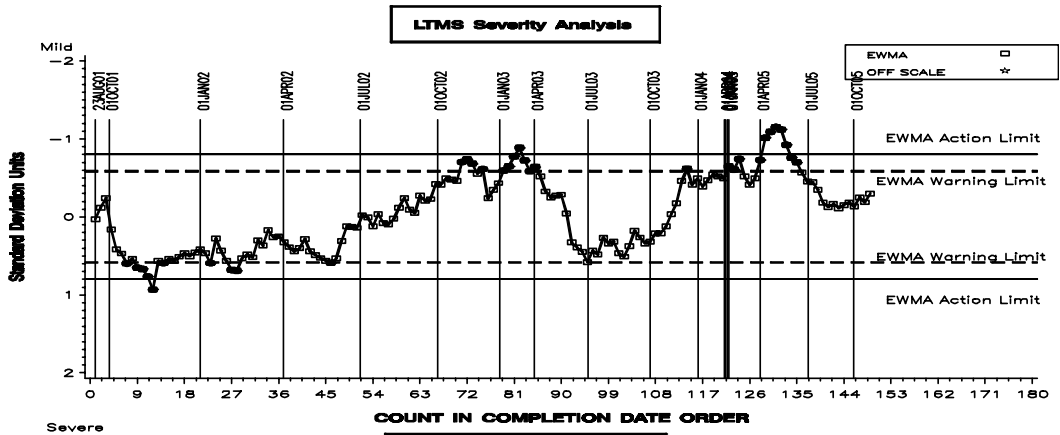
EOEC – FLUROELASTOMER INDUSTRY OPERATIONALLY VALID DATA

HARDNESS CHANGE (POINTS)



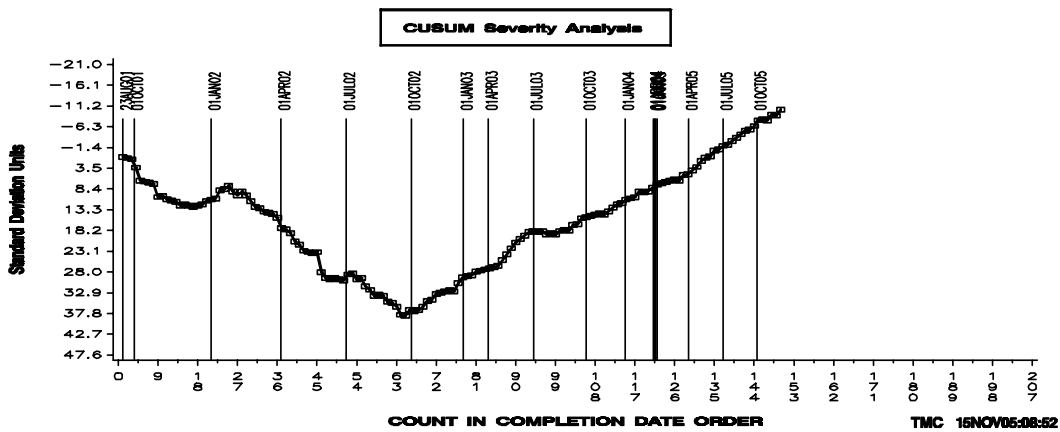
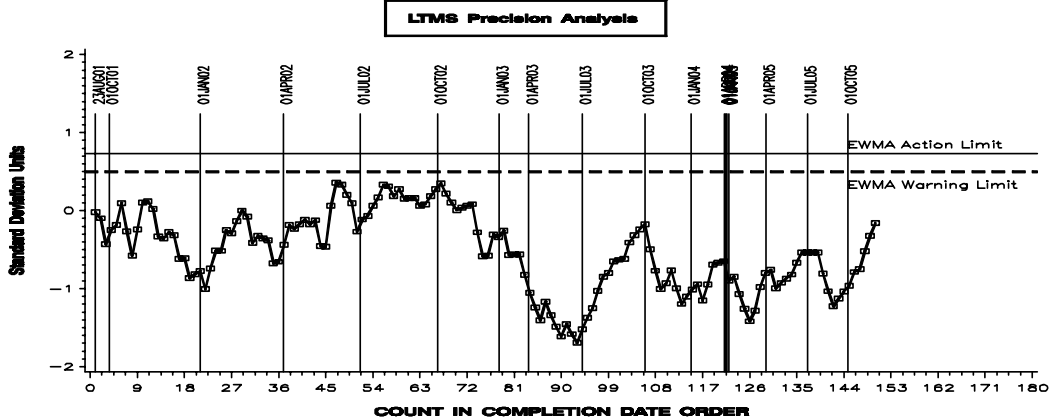
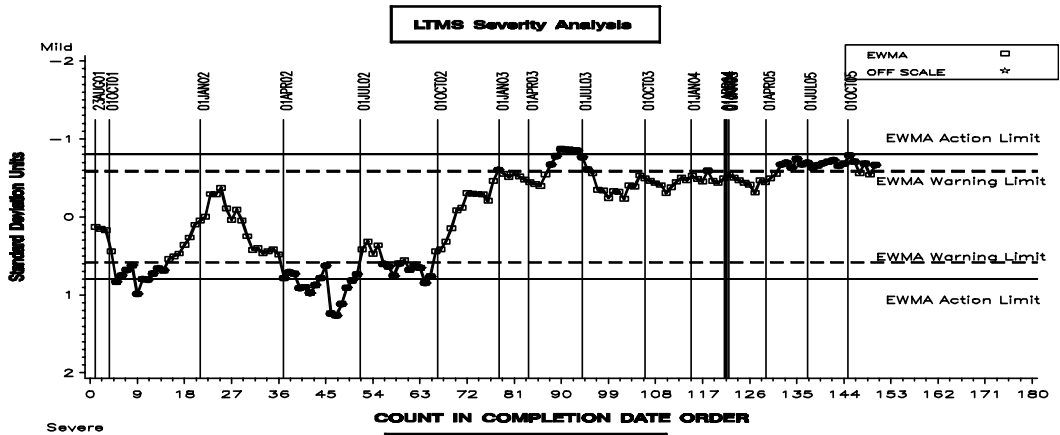
EOEC – NITRILE INDUSTRY OPERATIONALLY VALID DATA

HARDNESS CHANGE (POINTS)



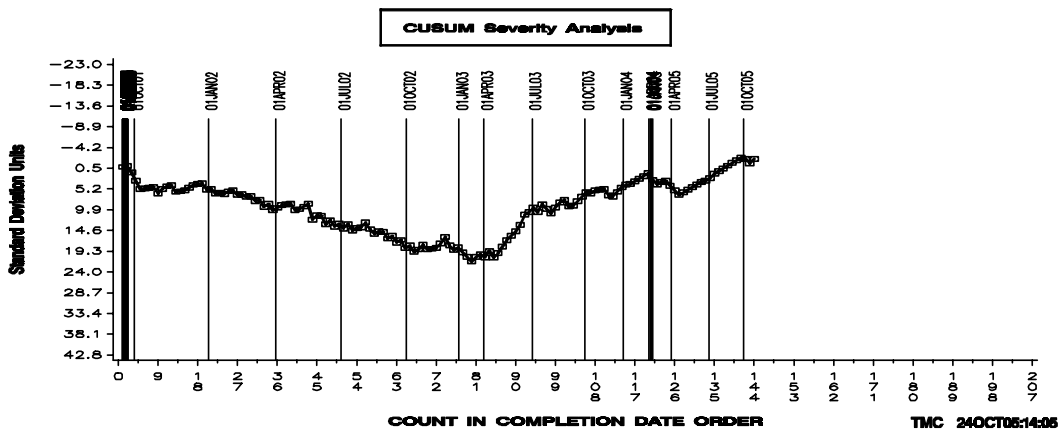
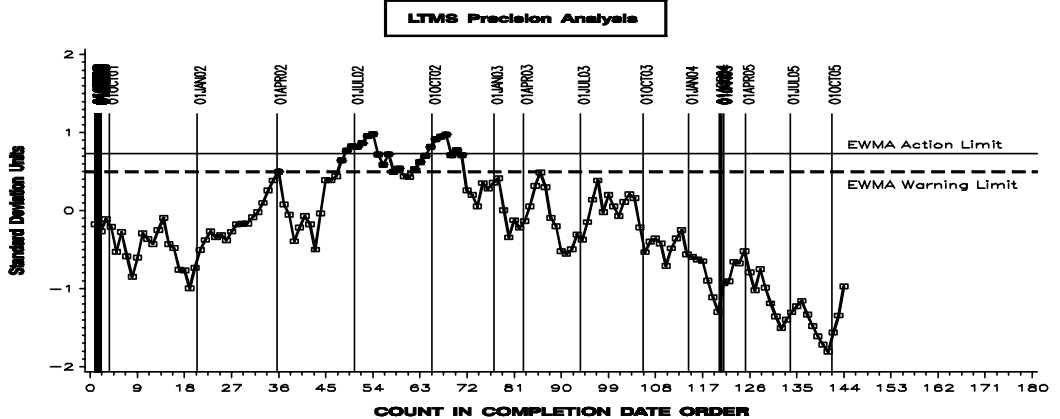
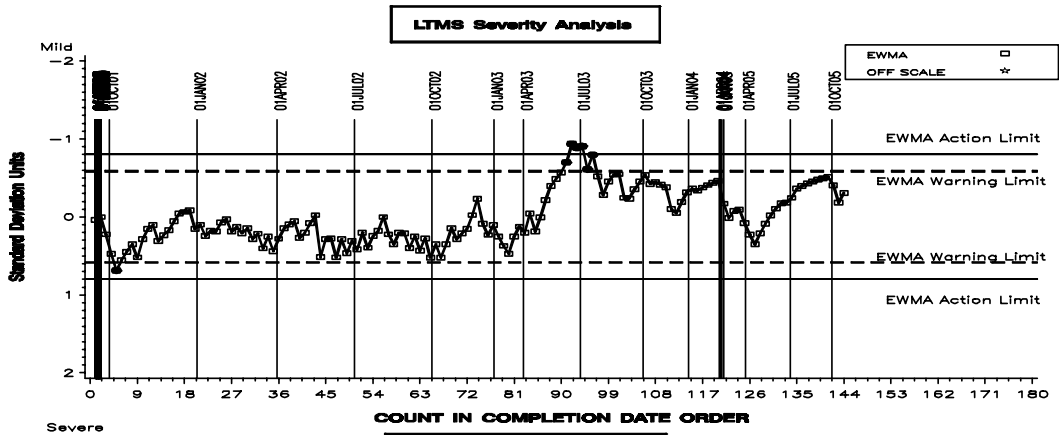
EOEC – POLYACRYLATE INDUSTRY OPERATIONALLY VALID DATA

HARDNESS CHANGE (POINTS)



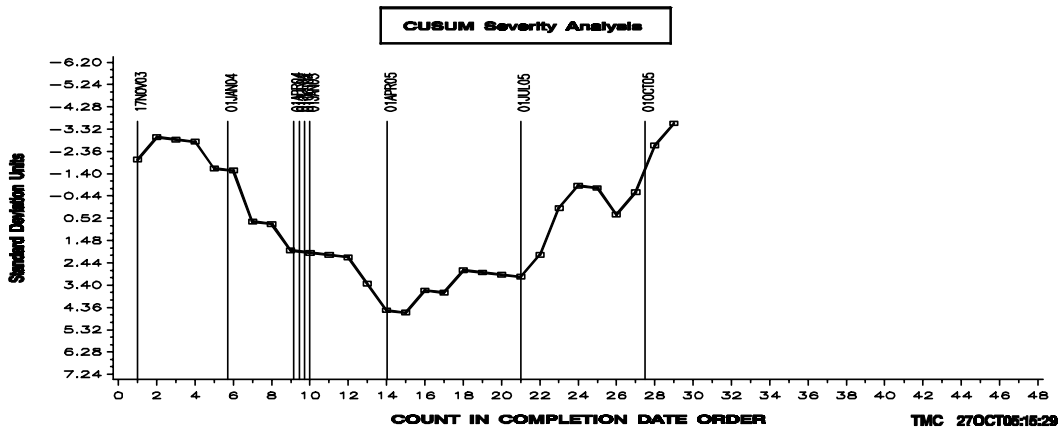
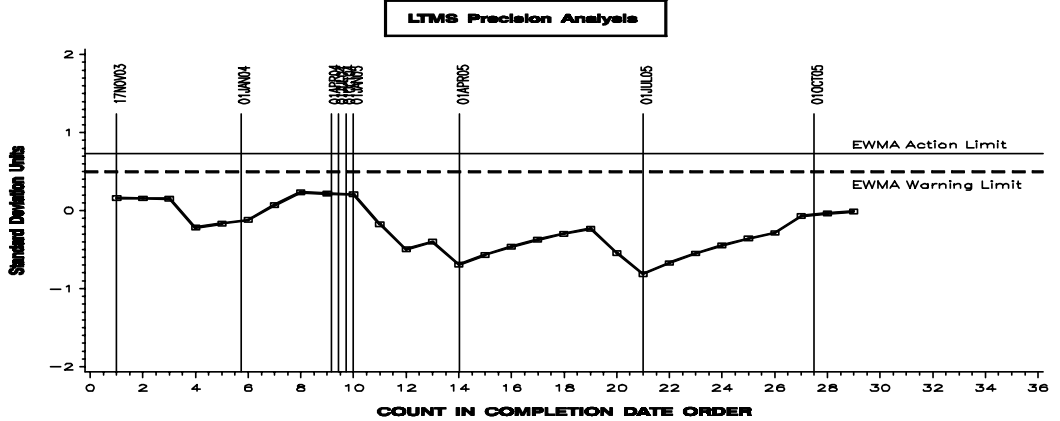
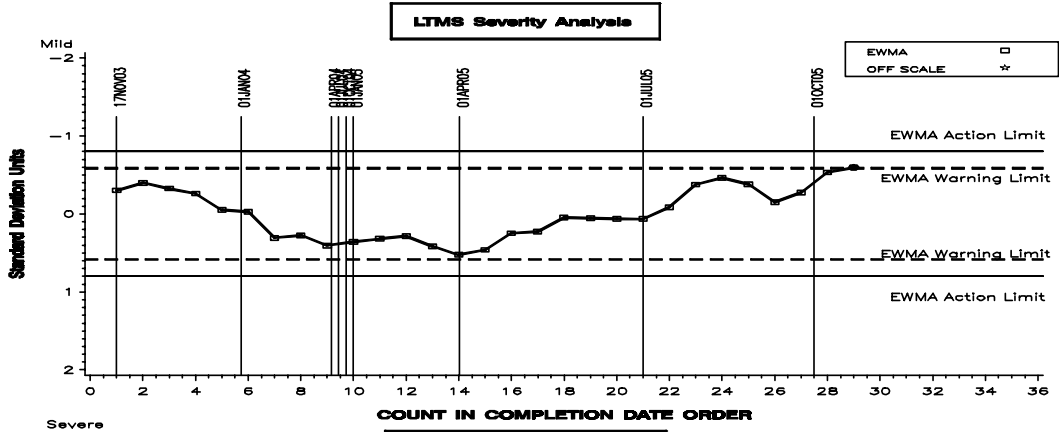
EOEC – SILICONE INDUSTRY OPERATIONALLY VALID DATA

HARDNESS CHANGE (POINTS)



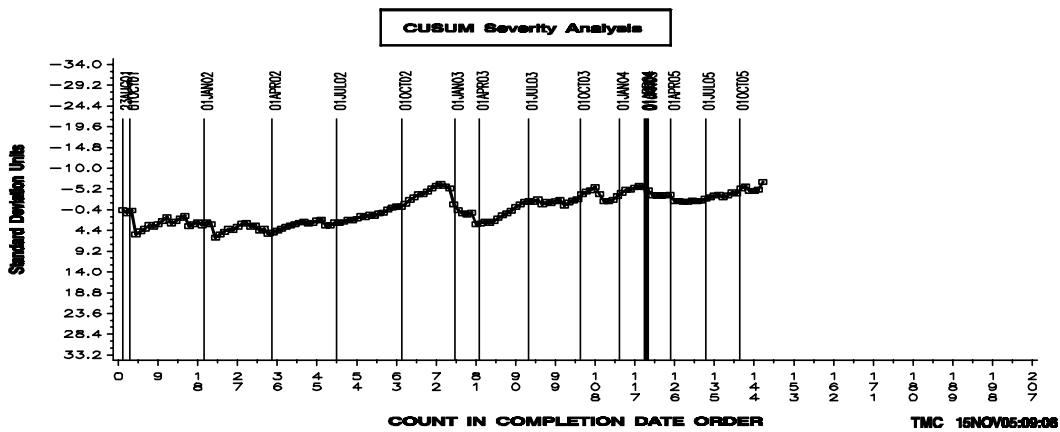
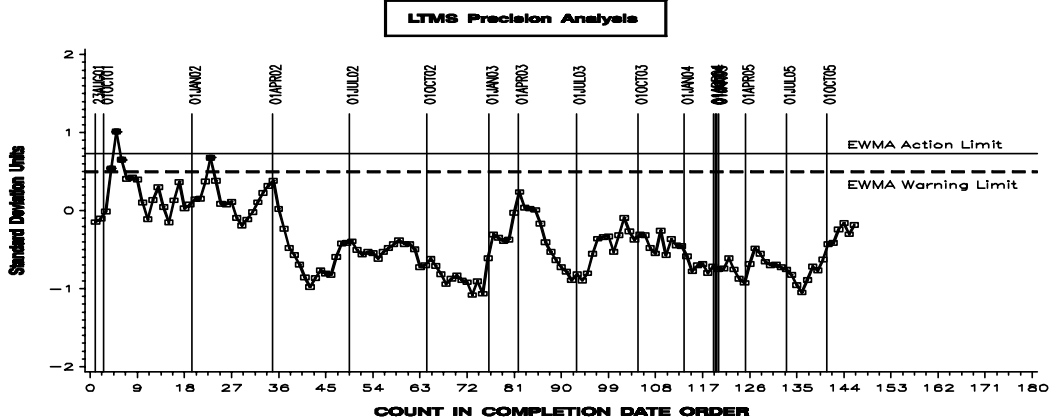
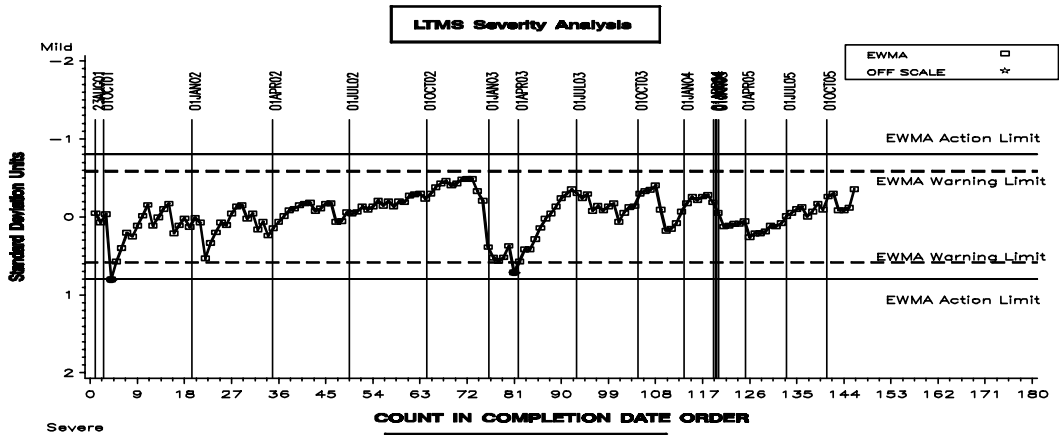
EOEC – VAMAC INDUSTRY OPERATIONALLY VALID DATA

HARDNESS CHANGE (POINTS)



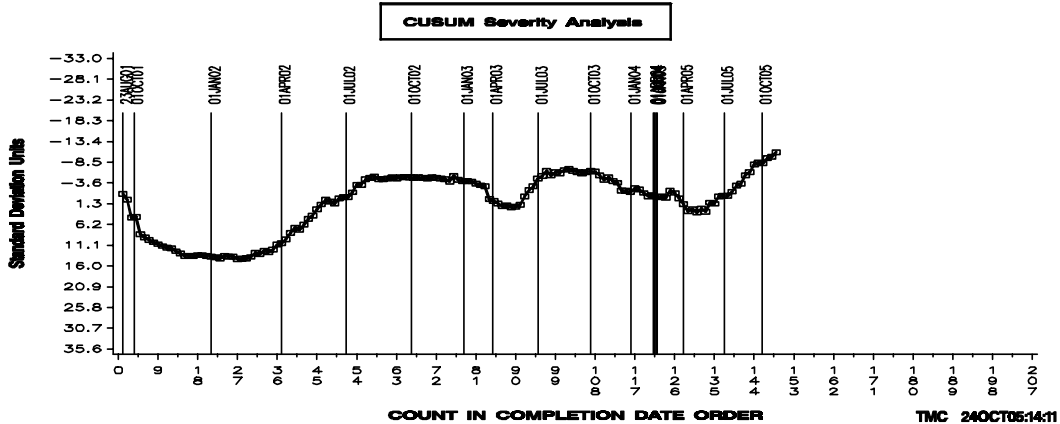
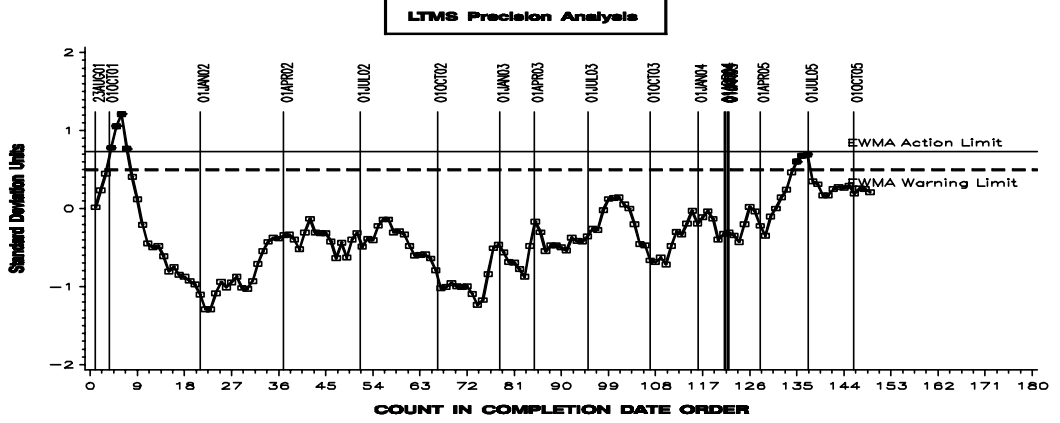
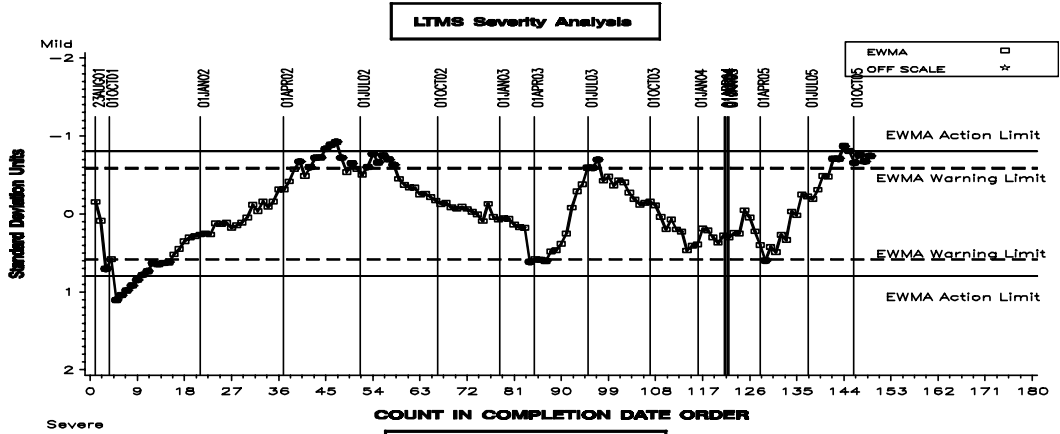
EOEC – FLUROELASTOMER INDUSTRY OPERATIONALLY VALID DATA

TENSILE STRENGTH CHANGE (%)



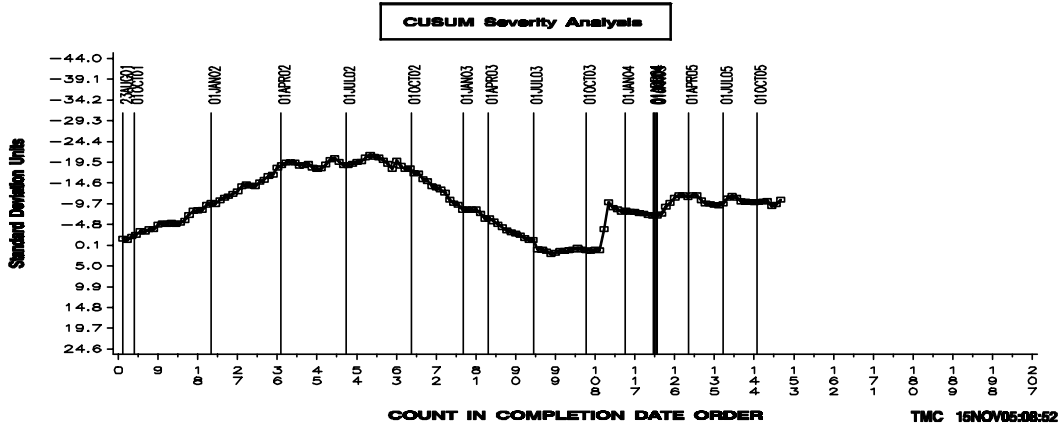
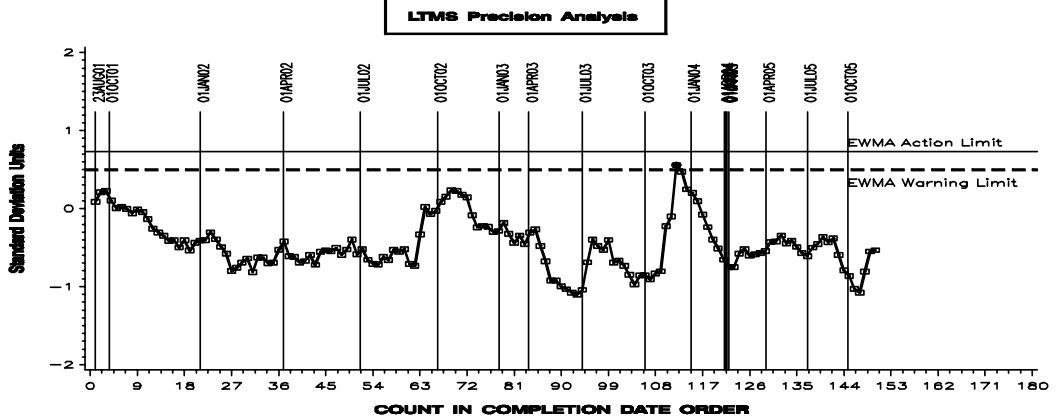
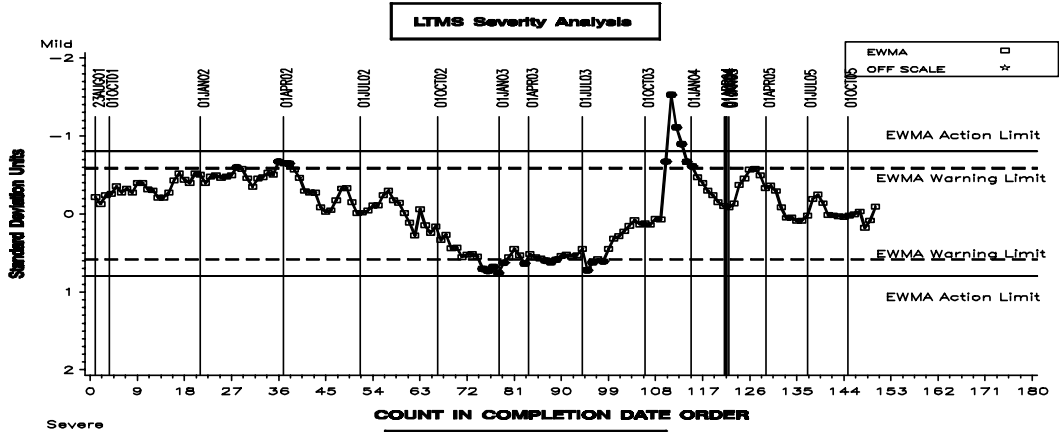
EOEC – NITRILE INDUSTRY OPERATIONALLY VALID DATA

TENSILE STRENGTH CHANGE (%)



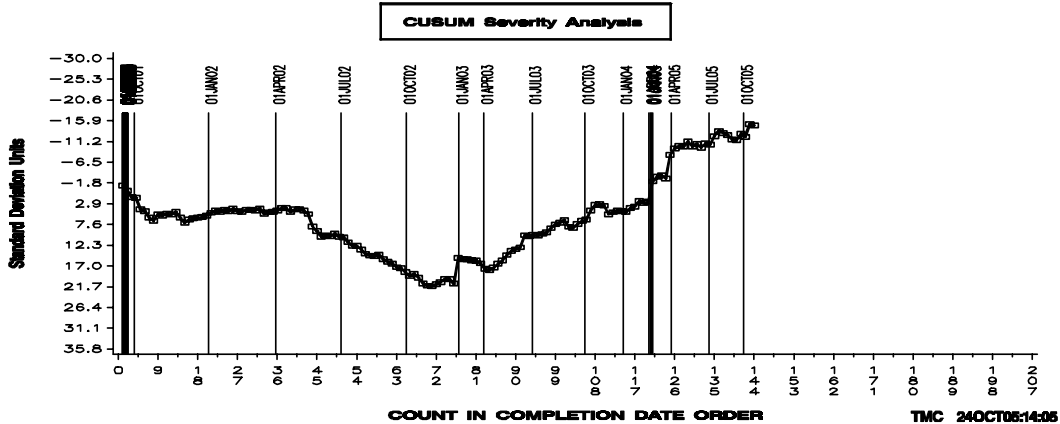
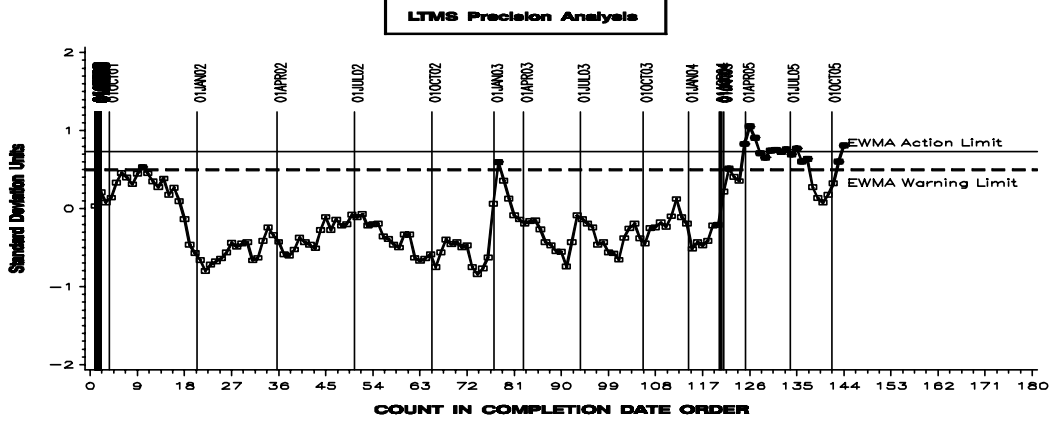
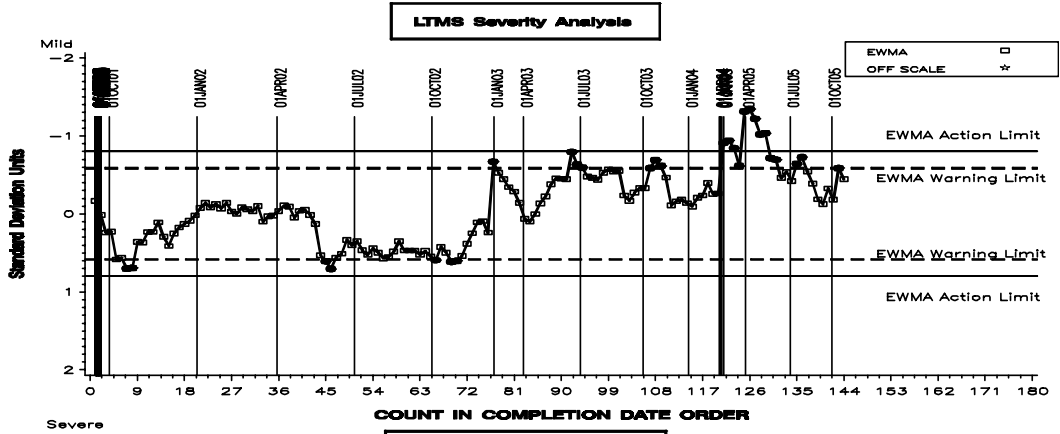
EOEC – POLYACRYLATE INDUSTRY OPERATIONALLY VALID DATA

TENSILE STRENGTH CHANGE (%)



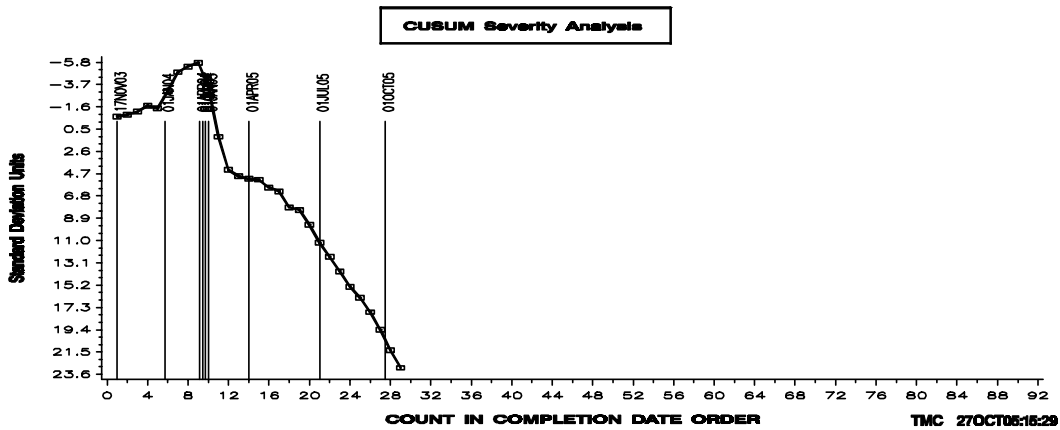
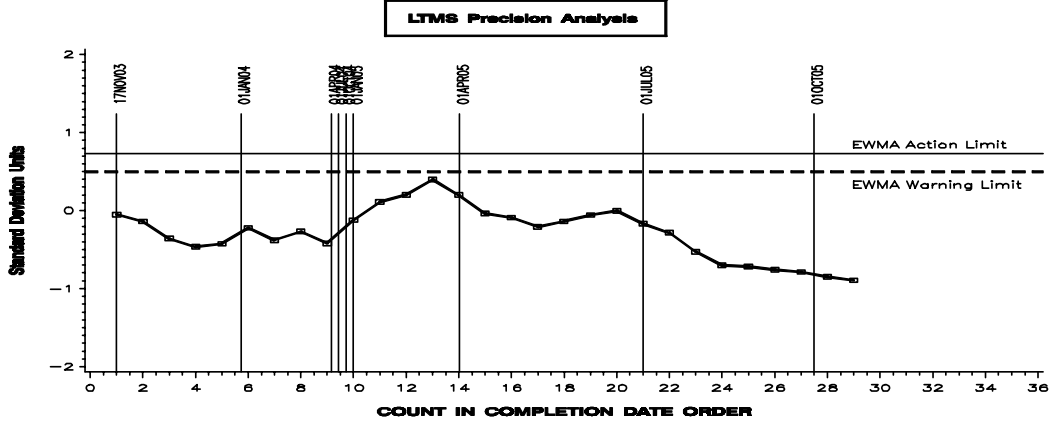
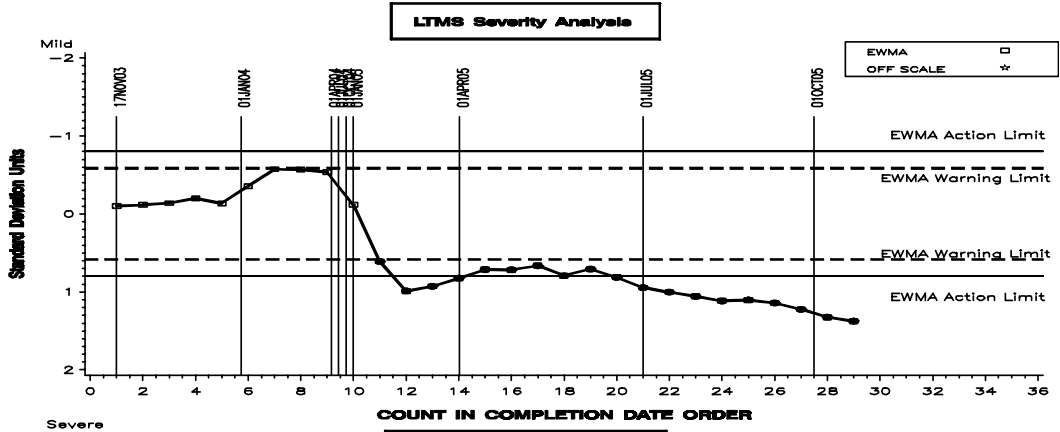
EOEC – SILICONE INDUSTRY OPERATIONALLY VALID DATA

TENSILE STRENGTH CHANGE (%)

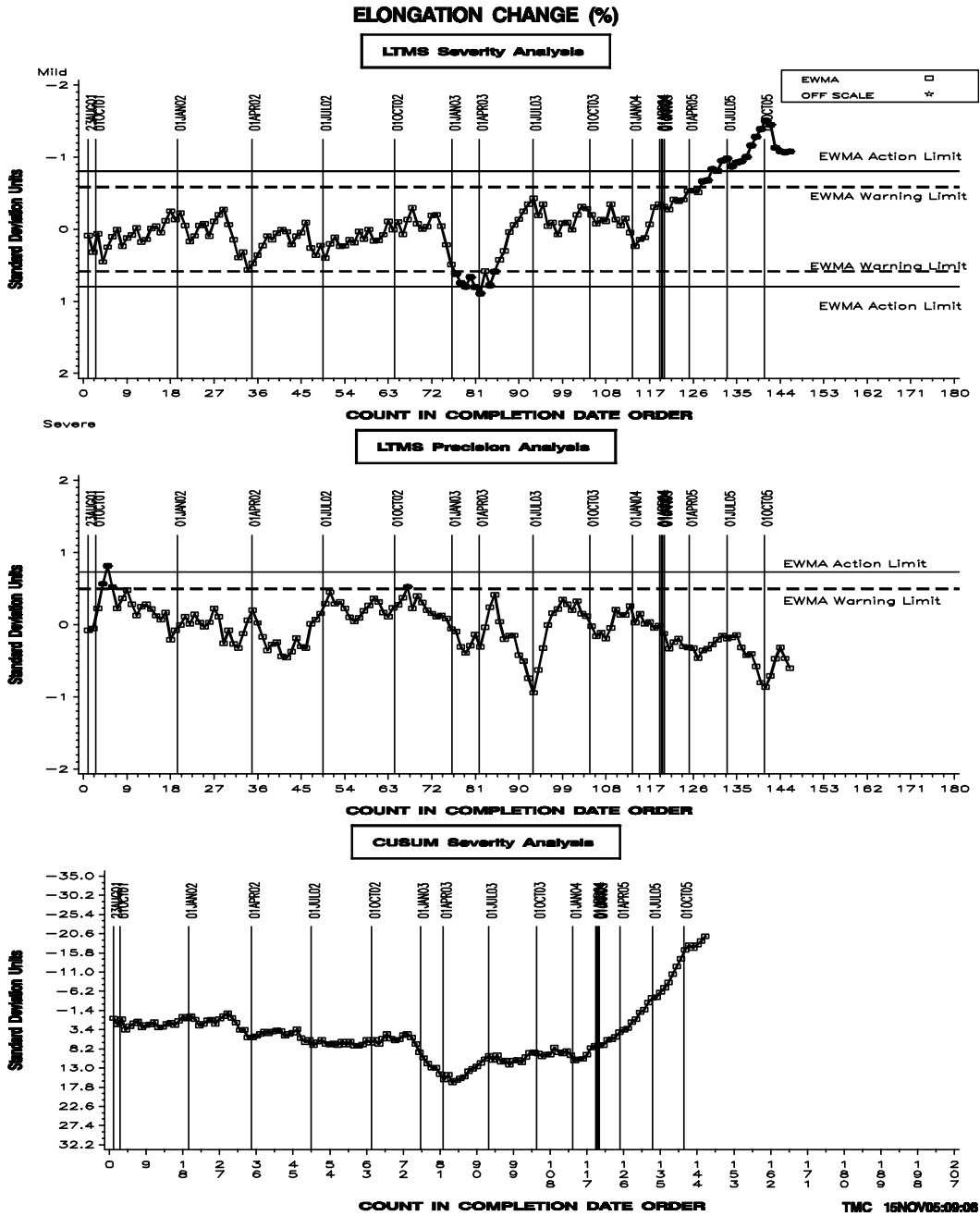


EOEC – VAMAC INDUSTRY OPERATIONALLY VALID DATA

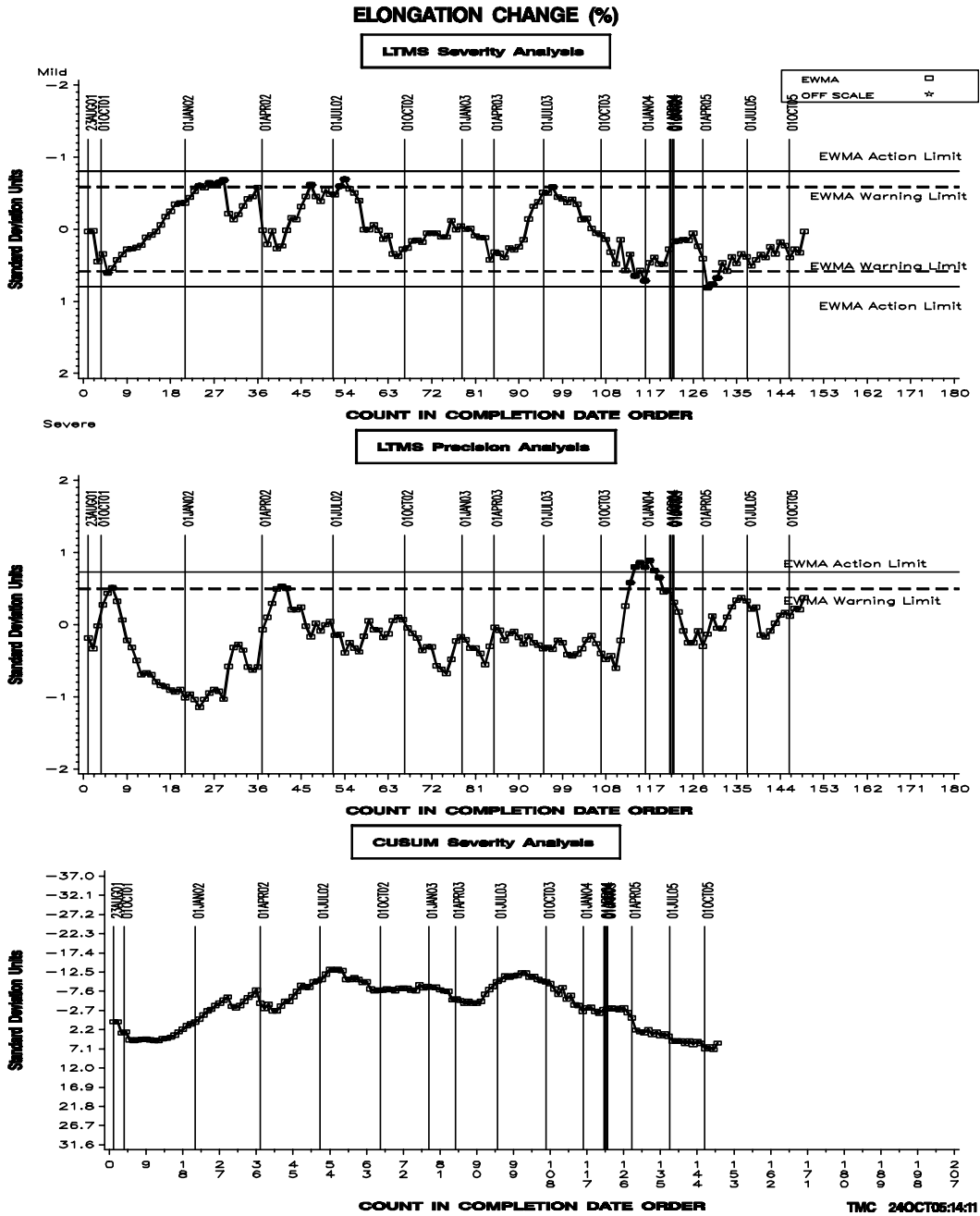
TENSILE STRENGTH CHANGE (%)



EOEC – FLUROELASTOMER INDUSTRY OPERATIONALLY VALID DATA

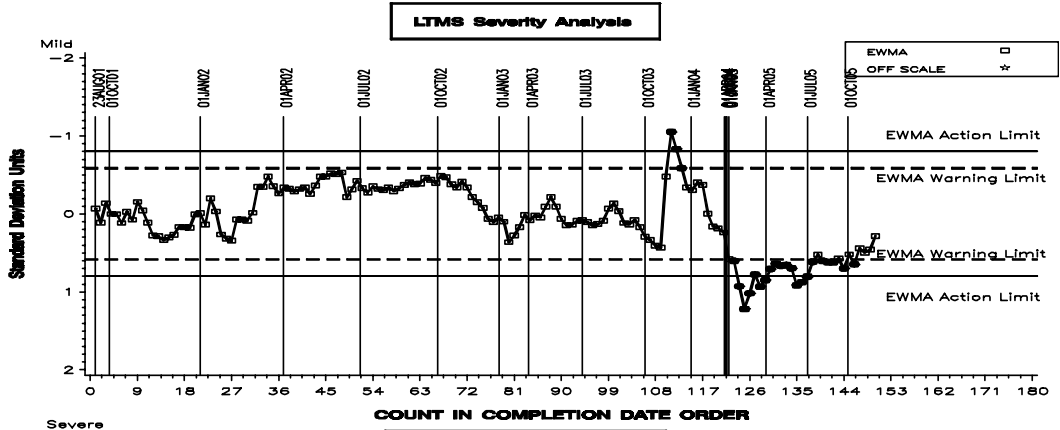


EOEC – NITRILE INDUSTRY OPERATIONALLY VALID DATA

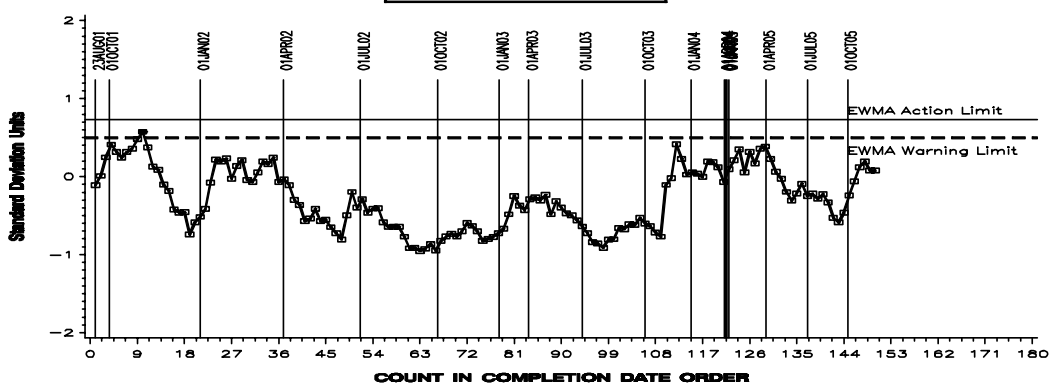


EOEC – POLYACRYLATE INDUSTRY OPERATIONALLY VALID DATA

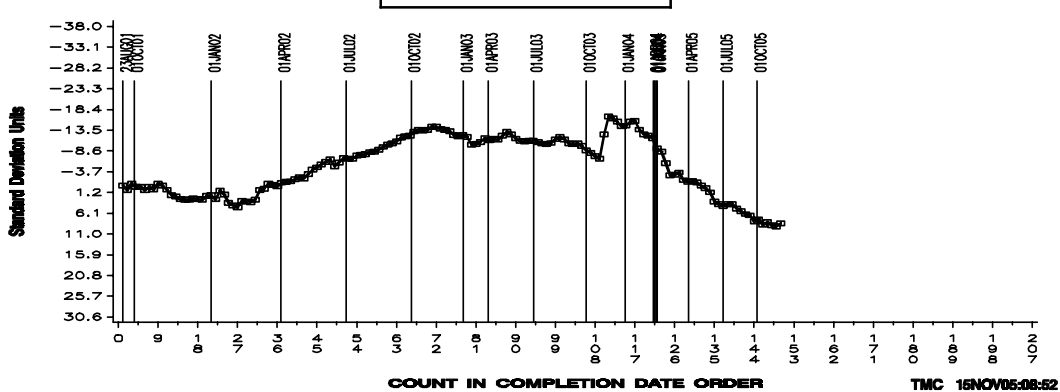
ELONGATION CHANGE (%)



LTMS Precision Analysis

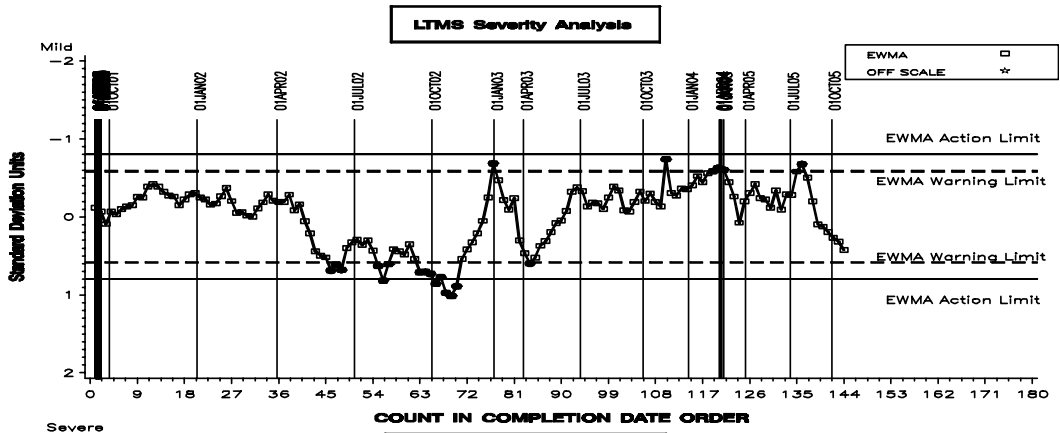


CUSUM Severity Analysis

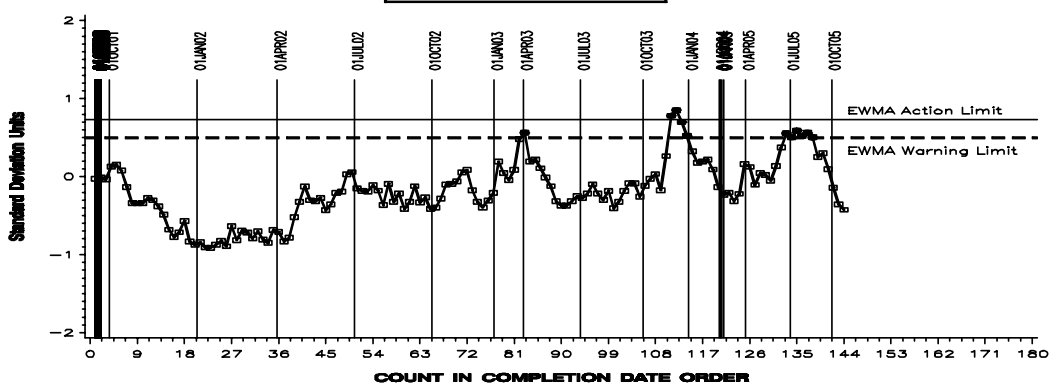


EOEC – SILICONE INDUSTRY OPERATIONALLY VALID DATA

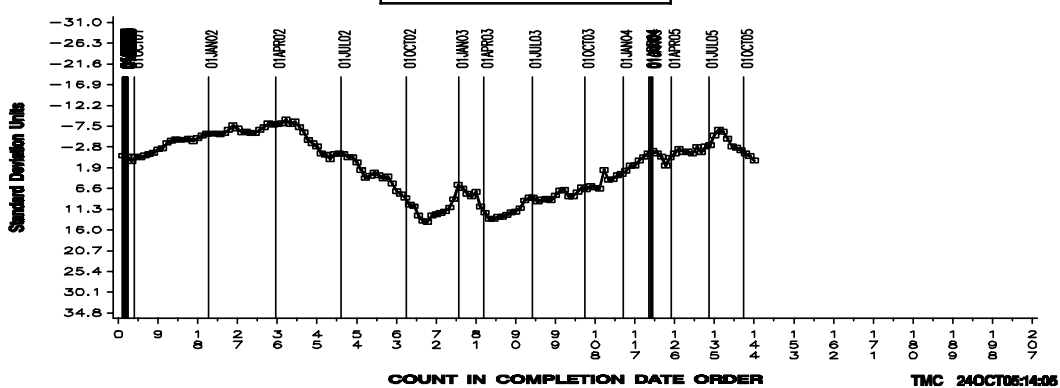
ELONGATION CHANGE (%)



LTMS Precision Analysis

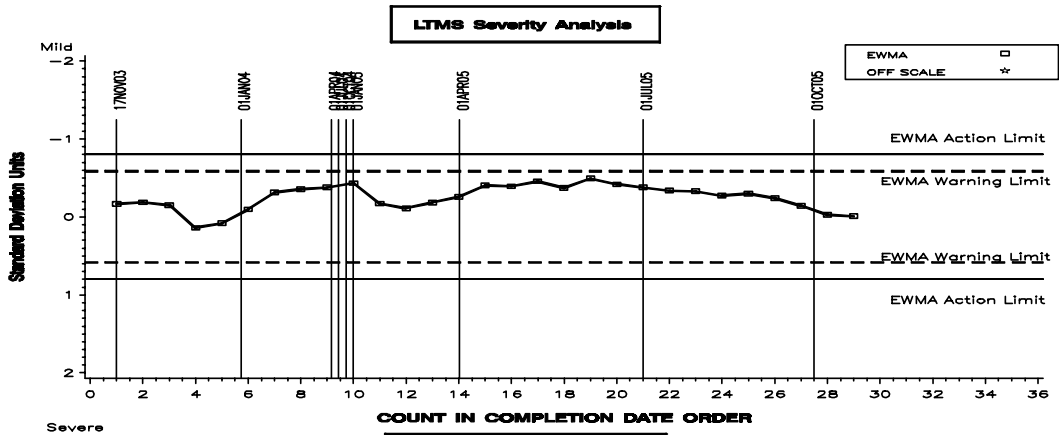


CUSUM Severity Analysis

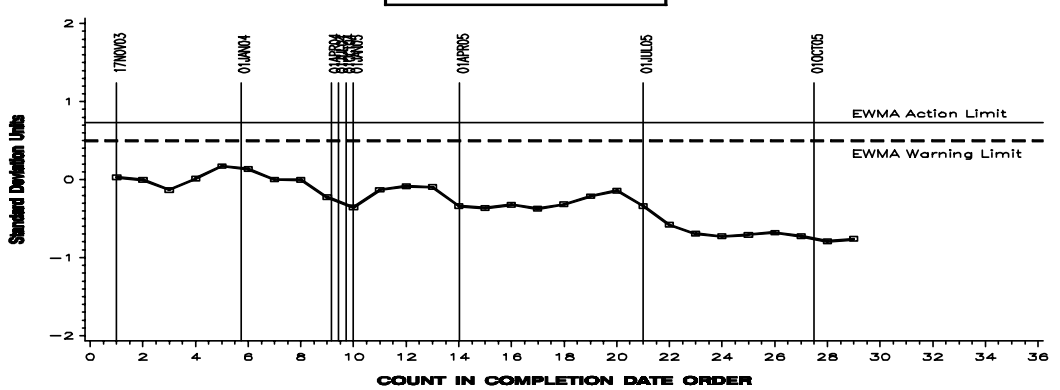


EOEC – VAMAC INDUSTRY OPERATIONALLY VALID DATA

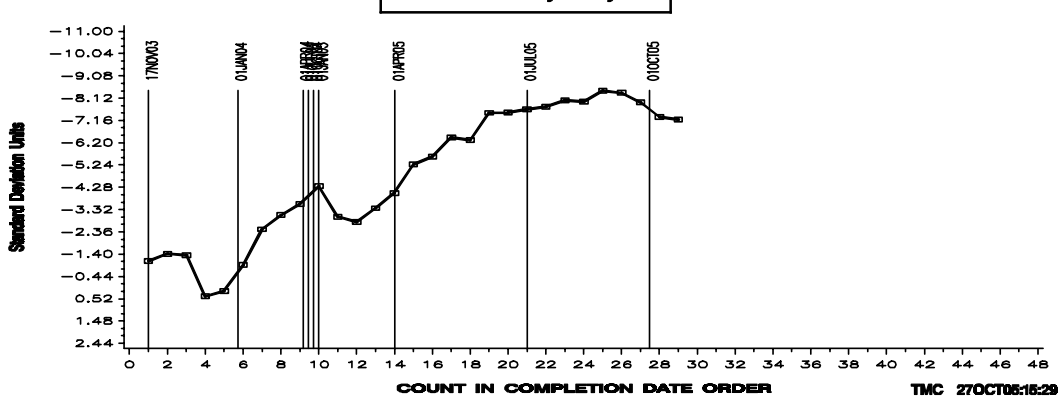
ELONGATION CHANGE (%)



LTMS Precision Analysis



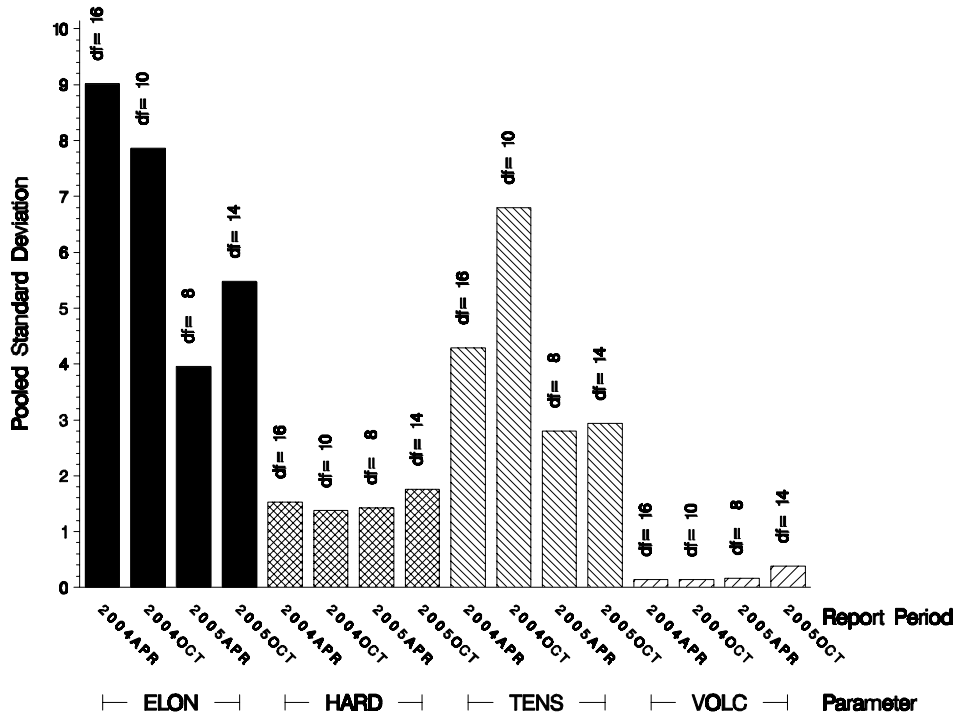
CUSUM Severity Analysis



POOLED S:

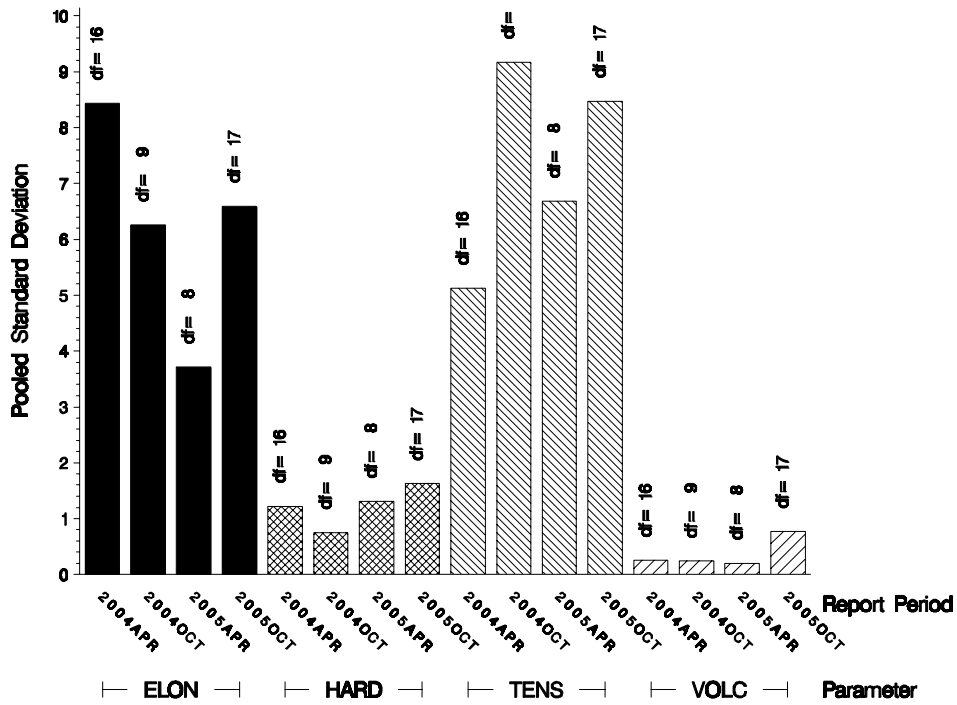
Shown below are bar charts comparing the pooled s values for the EOEC test parameters over the last four report periods. Where degrees of freedom equal zero, no bars are shown. This will occur where only one test was reported or where multiple tests are reported but all are on different oils. Periods showing no information had no tests reported.

FLUROELASTOMER TEST PRECISION
POOLED STANDARD DEVIATION BY SIX-MONTH ASTM REPORT PERIOD



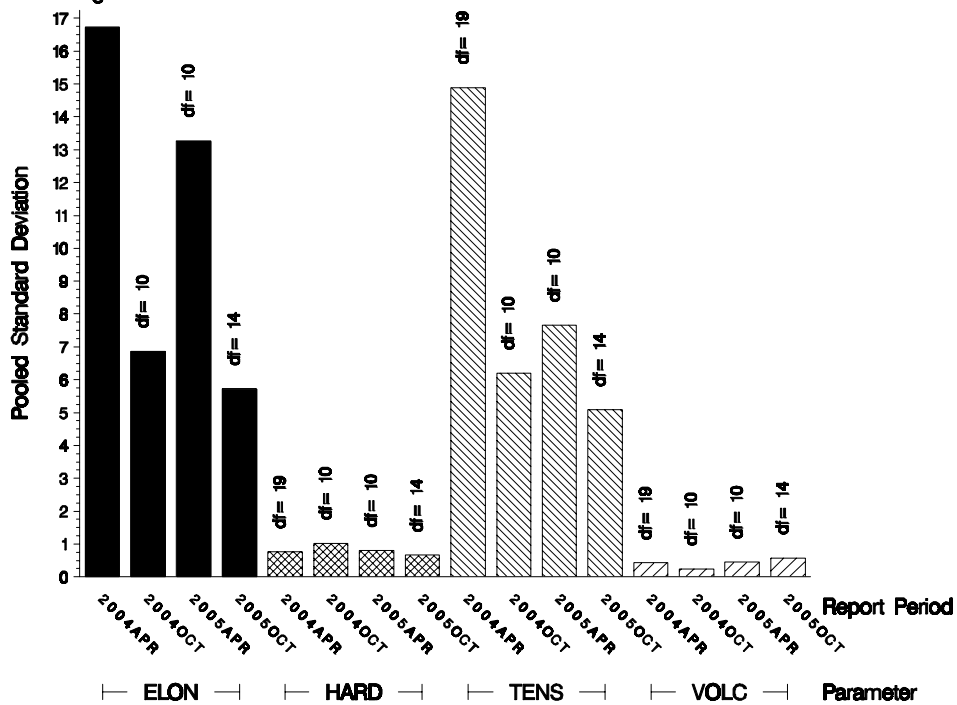
NITRILE TEST PRECISION

POOLED STANDARD DEVIATION BY SIX-MONTH ASTM REPORT PERIOD



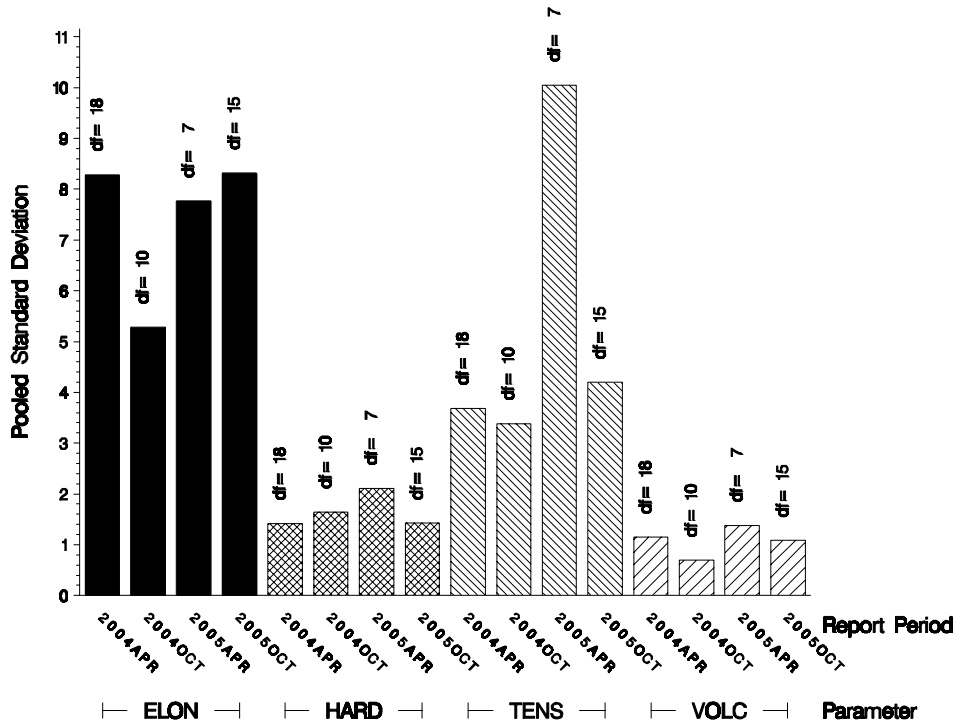
POLYACRYLATE TEST PRECISION

POOLED STANDARD DEVIATION BY SIX-MONTH ASTM REPORT PERIOD



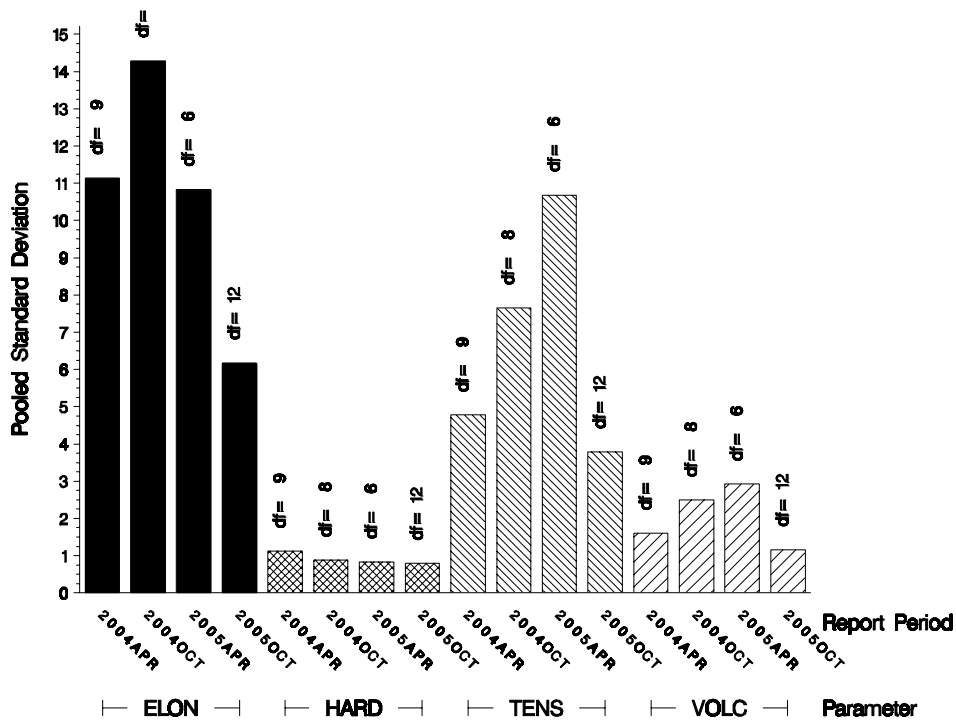
SILICONE TEST PRECISION

POOLED STANDARD DEVIATION BY SIX-MONTH ASTM REPORT PERIOD



VAMAC TEST PRECISION

POOLED STANDARD DEVIATION BY SIX-MONTH ASTM REPORT PERIOD



STATUS OF REFERENCE OIL SUPPLY:

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

Oil	Cans @ Labs	@TMC	
		Cans	Gallons
1006-1	78	17577	3483
Total	78	17577	3483

* 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 EOEC test area. This is not the case; all of these oils are also used in several other test areas.

INFORMATION LETTERS:

No information letters were issued during this report period

SUMMARY

- Over the course of this report period, VOLC, HARD, TENS, and ELON for all elastomer types remained within acceptable severity limits.
- Precision for all parameters remained within acceptable limits throughout this report period.

SDP/sdp/astm1005.doc/mem05-096.sdp.doc

c: J. L. Zalar

F. M. Farber

EOEC Surveillance Panel

<ftp://ftp.astmtmc.cmu.edu/docs/bench/eoec/semiannualreports/eoec-10-2005.pdf>

Distribution: email