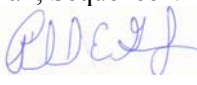




Test Monitoring Center

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

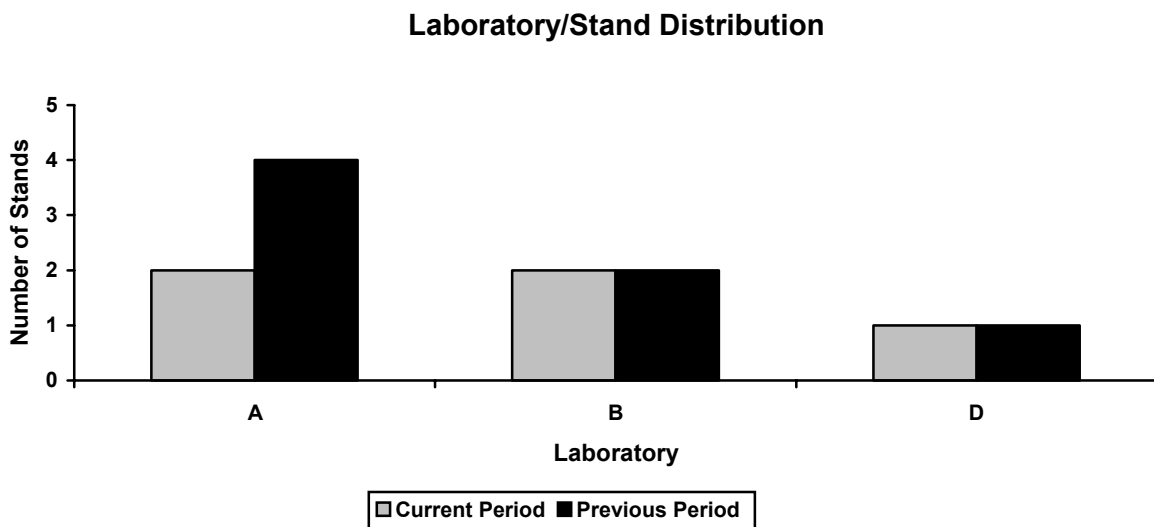
Memorandum: 05-011
Date: April 7, 2005
To: Fred Gerhart, Chairman, Sequence VIII Surveillance Panel
From: Richard E. Grundza 
Subject: Sequence VIII Semiannual Report: October 1, 2004 to March 31, 2005

The following is a summary of Sequence VIII reference oil tests that were reported to the Test Monitoring Center during the period from October 1, 2004 to March 31, 2005.

Lab/Stand Distribution

	Reporting Data	Calibrated as of March 31, 2005
Number of Laboratories:	3	3
Number of Stand/Engine Combinations:	5	5

The following chart shows the laboratory/stand distribution:



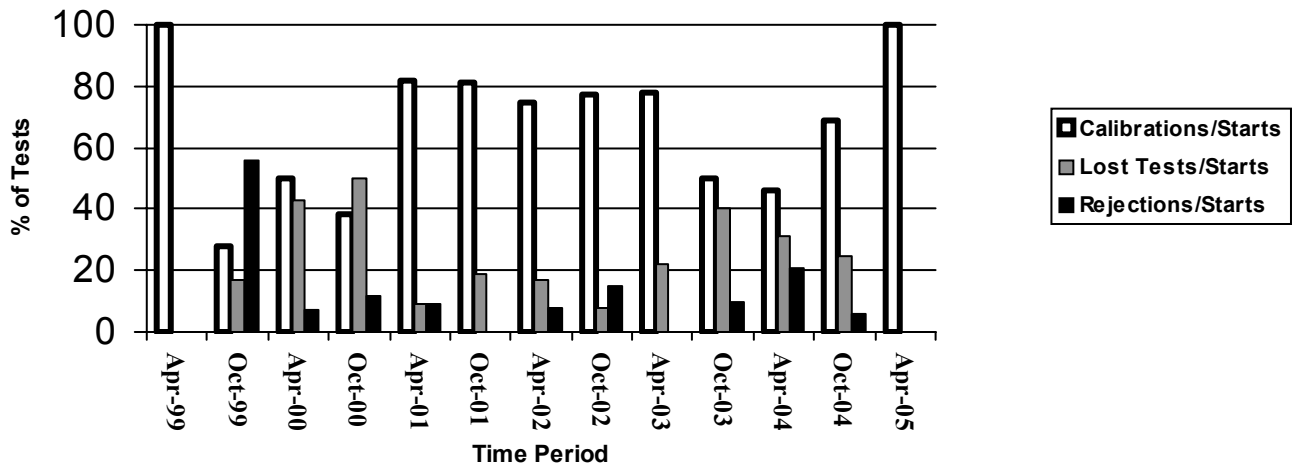
The following summarizes the status of the reference oil tests reported to the TMC:

Calibration Start Outcomes	TMC Validity Code	No. of Tests
Operationally and Statistically Acceptable	AC	5
Total		5

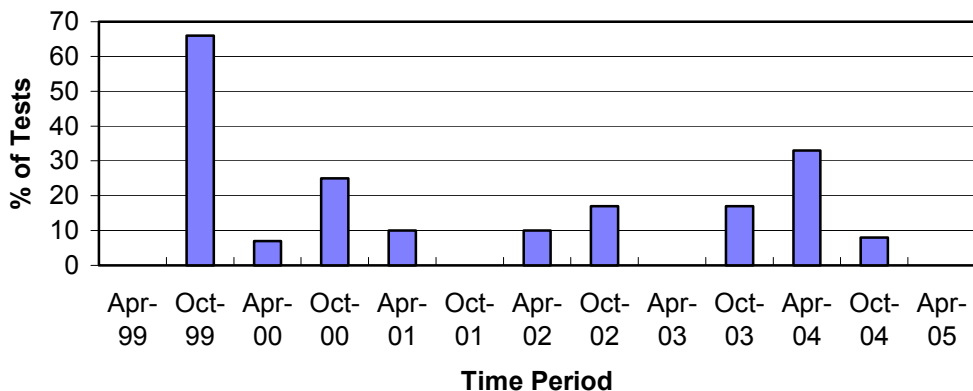
Donated & Industry Support Outcomes	TMC Validity Code	No. of Tests
Decoded Oil to evaluate potential change to external oil system	NI	1
Total		1

Calibrations per start, lost tests per start and rejection rates are summarized below:

Calibration Attempt Summary



Rejected Operationally Valid Tests



No tests failed this period.

There were no LTMS Deviations this period. There have been no deviations from the LTMS since its introduction in 1999.

No lab visits were conducted this period.

Lost Test Summary

There were no lost tests this period.

Information Letters

Sequence VIII Information Letter 04-1 was issued December 9, 2004. This letter allows the use of oversized pistons, revised the fuel flow specification and clarified the specifications for solvents meeting ASTM D235, Type II, Class C.

Severity and Precision Analysis

Below is a summary of the average Δ/s , pooled standard deviation, and average Δ in reported units for the tests reported during this period. Also below is a summary of the average Δ/s value for all laboratories reporting data during this period.

Industry Severity Summary			
Parameter	Average Δ/s	Pooled standard deviation (degrees of freedom)	Average Δ, in reported units
BWL	0.103	2.66 (df=4)	0.27 mg
SVIS	0.313	0.11 (df=4)	0.03 cSt

Average Δ/s by Laboratory		
Lab	BWL	SVIS
A	-0.97	-0.28
B	0.93	1.06
D	0.60	0.00

Bearing Weight Loss (BWL)

The industry control charts for both severity and precision were in control for the period (see Figure 1).

The Industry BWL mean Δ/s is 0.103 severe for this report period (see Figure 3). This equates to a shift of 0.27 mg in reported units. The pooled standard deviation for the period is 2.66 mg (see Figure 4), which has degraded somewhat with respect to the previous period, but compares well with historical estimates.

Figures 7 and 8 graphically illustrate the lead content, in ppm, versus test severity in delta/s. The highest concentration of lead reported this period was 315 ppm. The lead levels in the bearing storage oil continue to rise.

Stripped Viscosity (SVIS)

The industry control charts for both severity and precision were in control for the period (see Figure 2).

The Industry SVIS mean Δ/s is 0.313 mild for this report period (see Figures 2 & 5). This equates to a shift of 0.03 cSt in reported units. The pooled standard deviation for the period is 0.11 cSt (see Figure 6), which is comparable to historical performance.

Hardware

No hardware changes were made during the period.

Reference Oils

Oil	TMC Inventory, In gallons	TMC Inventory, In tests	Laboratory Inventory, in tests	Estimated Life
704-1	407	203	6	5+ years
1006	43	21	3	3 months ¹
1006-2	4,774	2,387	4	3+ years ¹
1009	834	417	1	3+ years ¹

¹ Multiple test area reference oil; total TMC inventory shown

REG/reg

Attachments

c: F. M. Farber, TMC
Sequence VIII Surveillance Panel
<ftp://ftp.astmtmc.cmu.edu/docs/gas/sequenceviii/semiannualreports/VIII-04-2005.pdf>

Distribution: Electronic Mail

List of Figures

- Figure 1 graphically presents the Industry control charts for BWL and also the CUSUM delta/s plot (by count in completion date order) of bearing weight loss for operationally valid tests.
- Figure 2 graphically presents the Industry control charts for SVIS and also the CUSUM delta/s plot (by count in completion date order) of bearing weight loss for operationally valid tests.
- Figure 3 graphically presents a historic perspective for BWL mean delta/s by report period.
- Figure 4 graphically presents a historic perspective for BWL pooled standard deviations by report period.
- Figure 5 graphically presents a historic perspective for SVIS mean delta/s by report period.
- Figure 6 graphically presents a historic perspective for SVIS pooled standard deviations by report period.
- Figure 7 graphically presents a comparison of Total Bearing Weight Loss (Delta/s) vs. the amount of lead content, in ppm, in the bearing storage oil.
- Figure 8 graphically presents the amount of lead content, in ppm, in the bearing storage oil by completion date order (Sequence VIII and L-38 data combined).
- Figure 9 is the Sequence VIII Timeline, created to track changes in test hardware and operations.

Figure 1

SEQUENCE VIII INDUSTRY OPERATIONALLY VALID DATA

FINAL BEARING WEIGHT LOSS

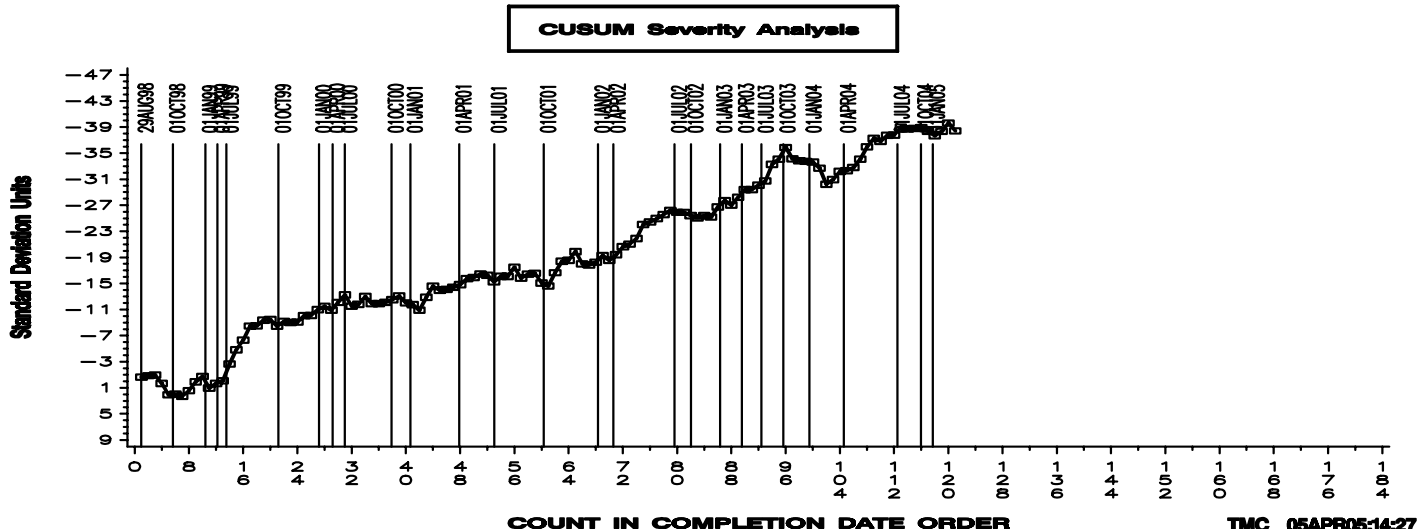
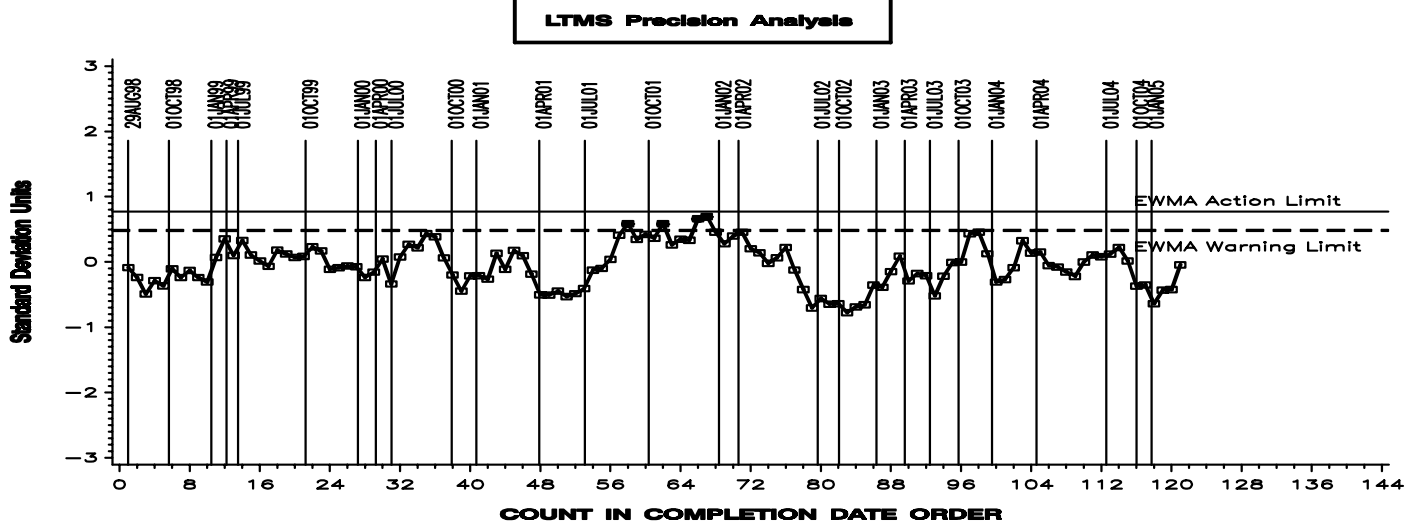
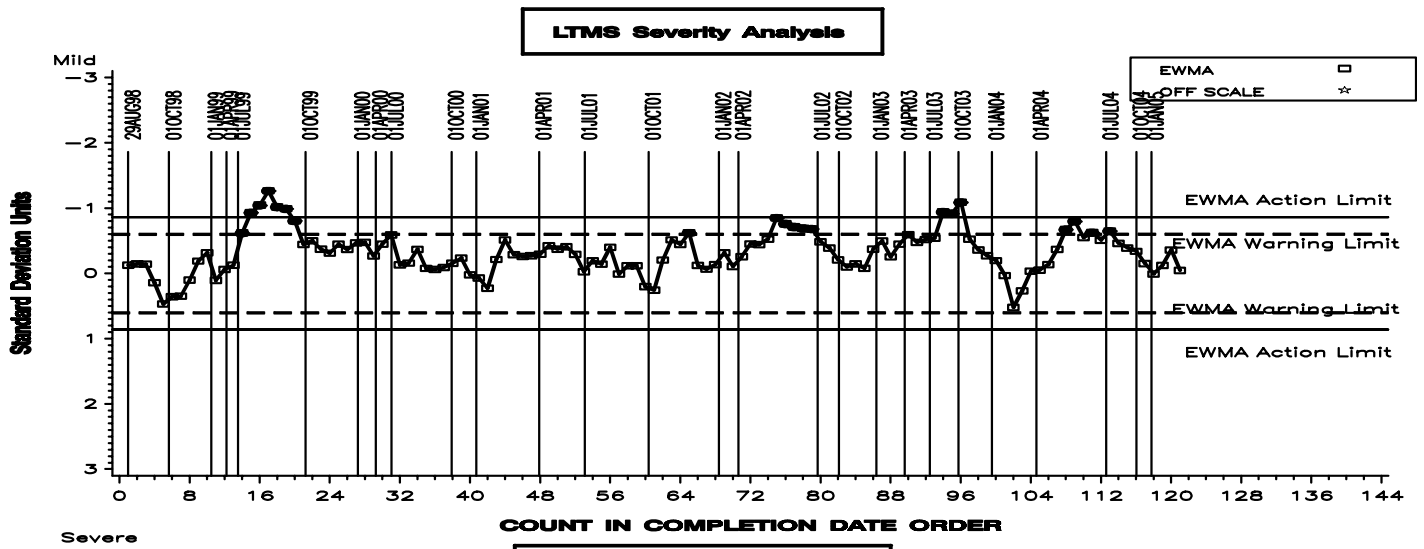


Figure 2

SEQUENCE VIII INDUSTRY OPERATIONALLY VALID DATA

STRIPPED VIS. @ 100 DEG C

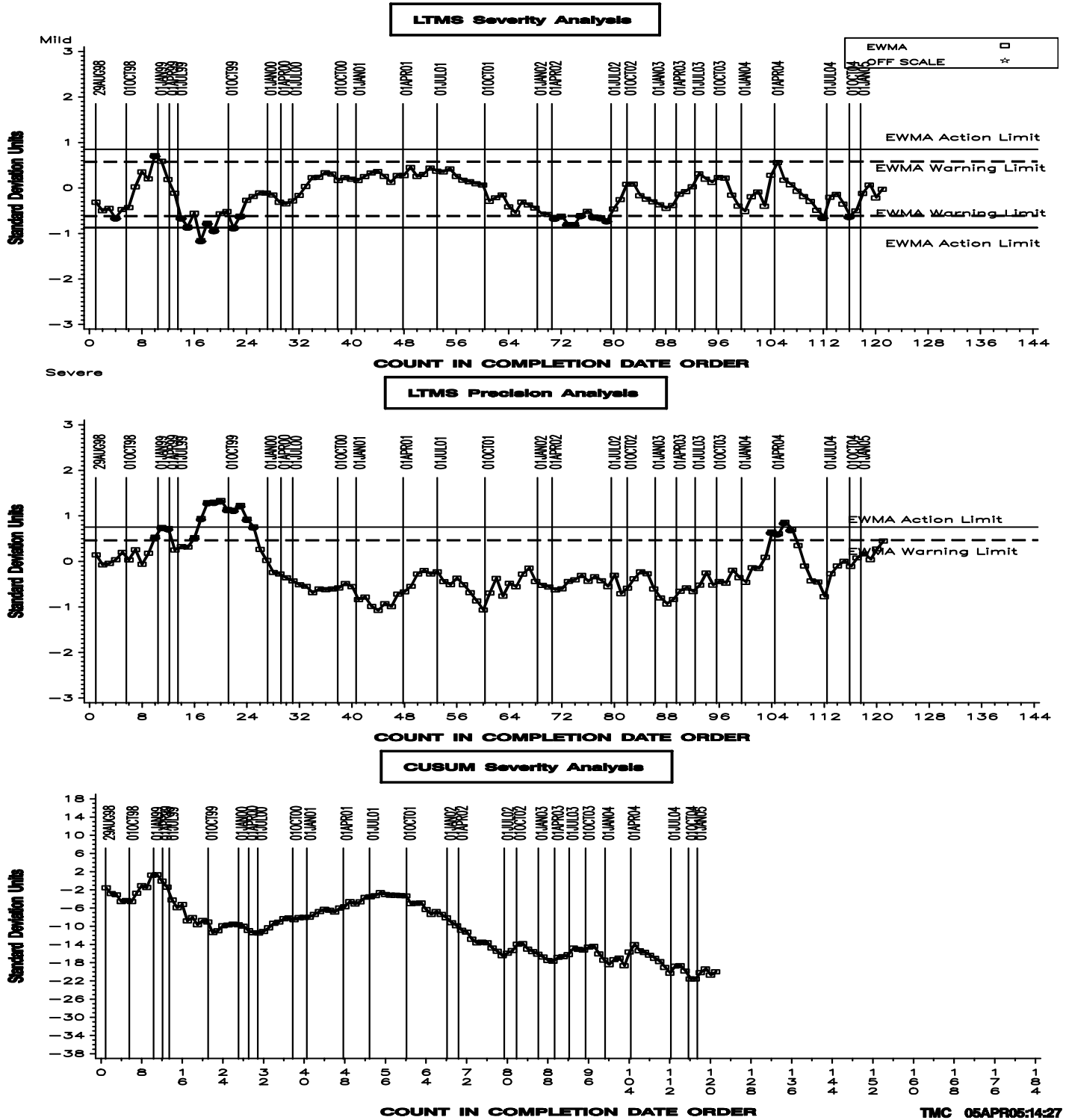
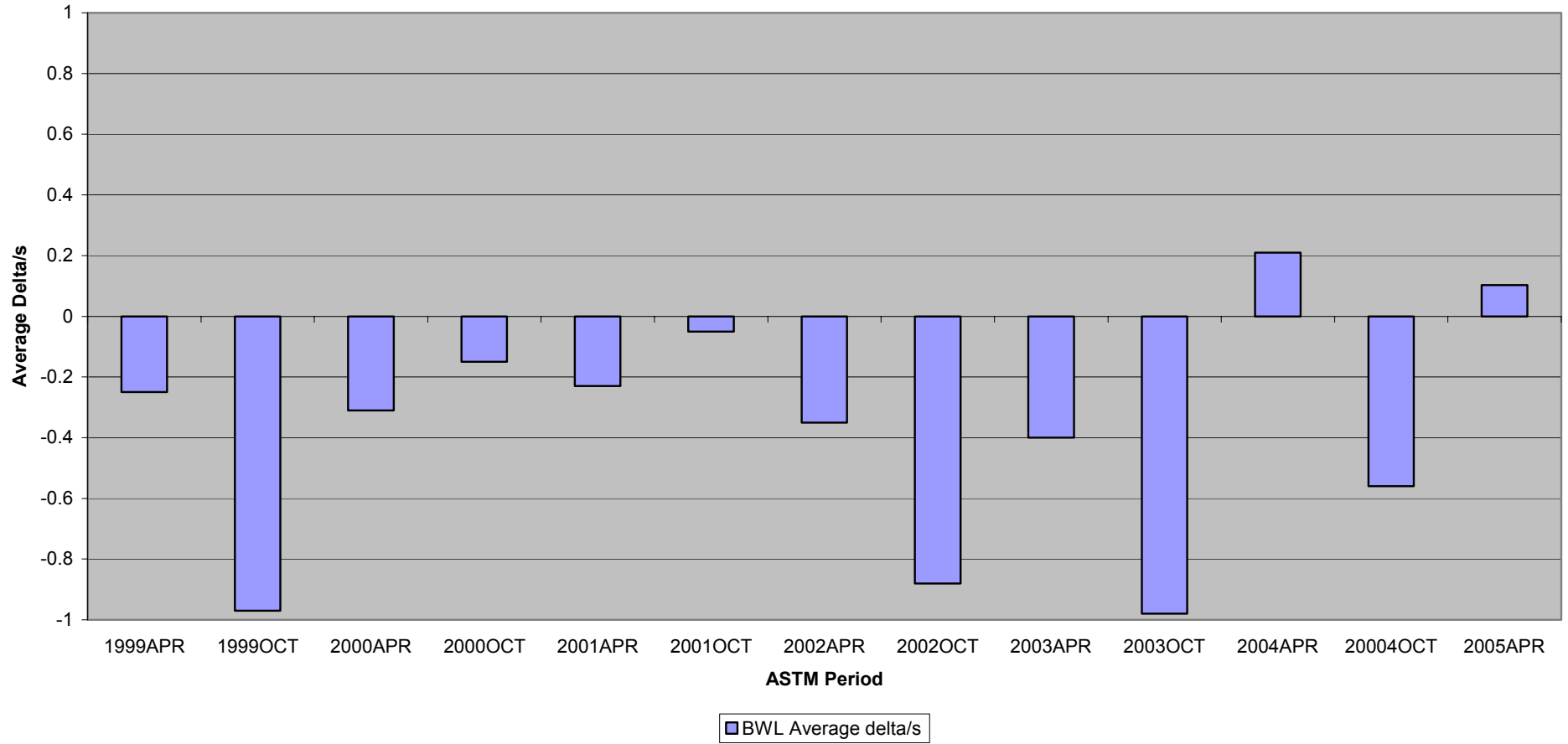
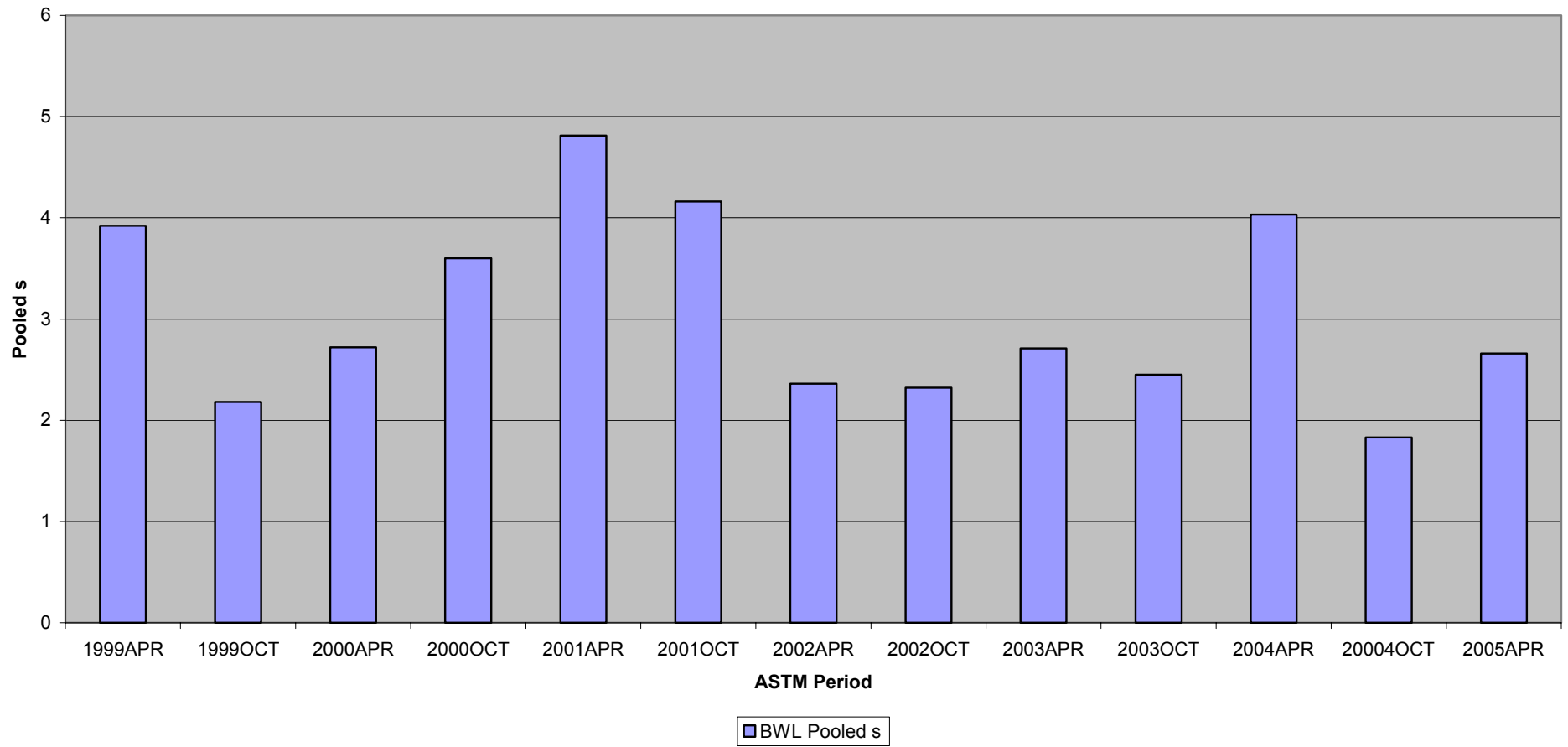


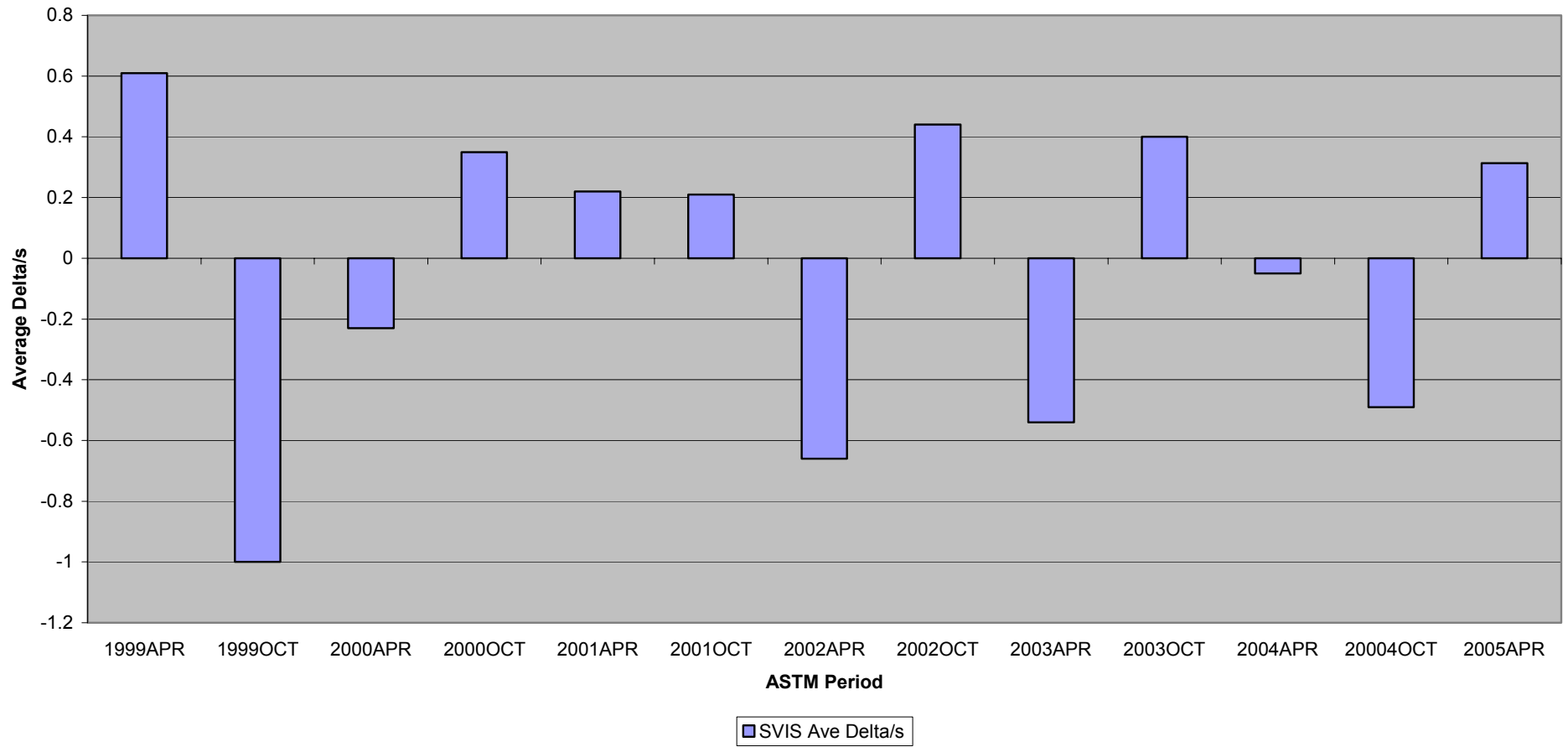
Figure 3 - Sequence VIII Reference Oil Data
Bearing Weight Loss



**Figure 4 - Sequence VIII Reference Oil Data
Bearing Weight Loss**



**Figure 5 - Sequence VIII Reference Oil Data
Stripped Viscosity**



**Figure 6 - Sequence VIII Reference Oil Data
Stripped Viscosity**

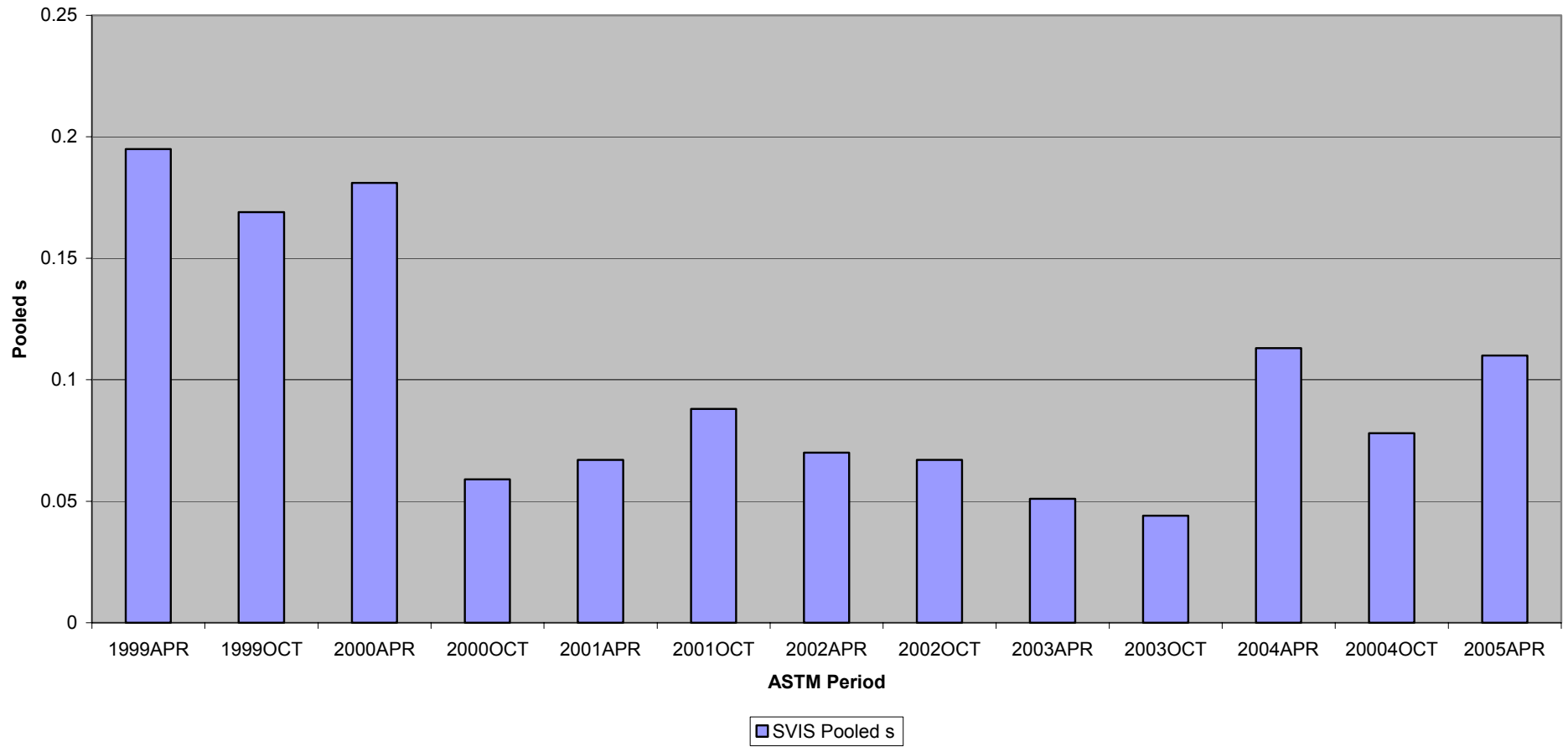


Figure 7

SEQUENCE VIII BWL DELTA/S vs LEAD PPM

All LTMS Data

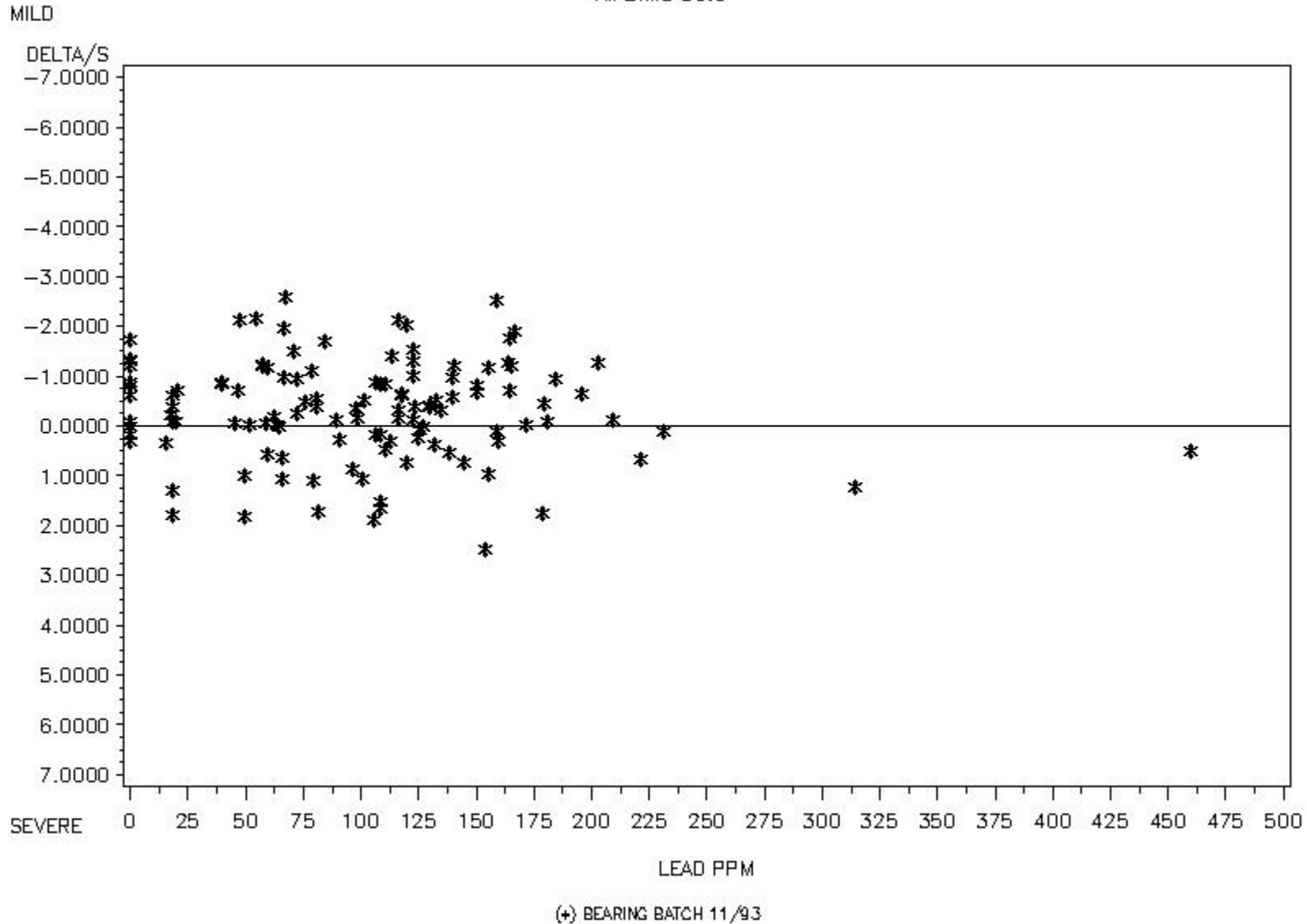


Figure 8

BEARING OIL STORAGE LEAD PPM vs COMPLETION DATE
All LTMS Data

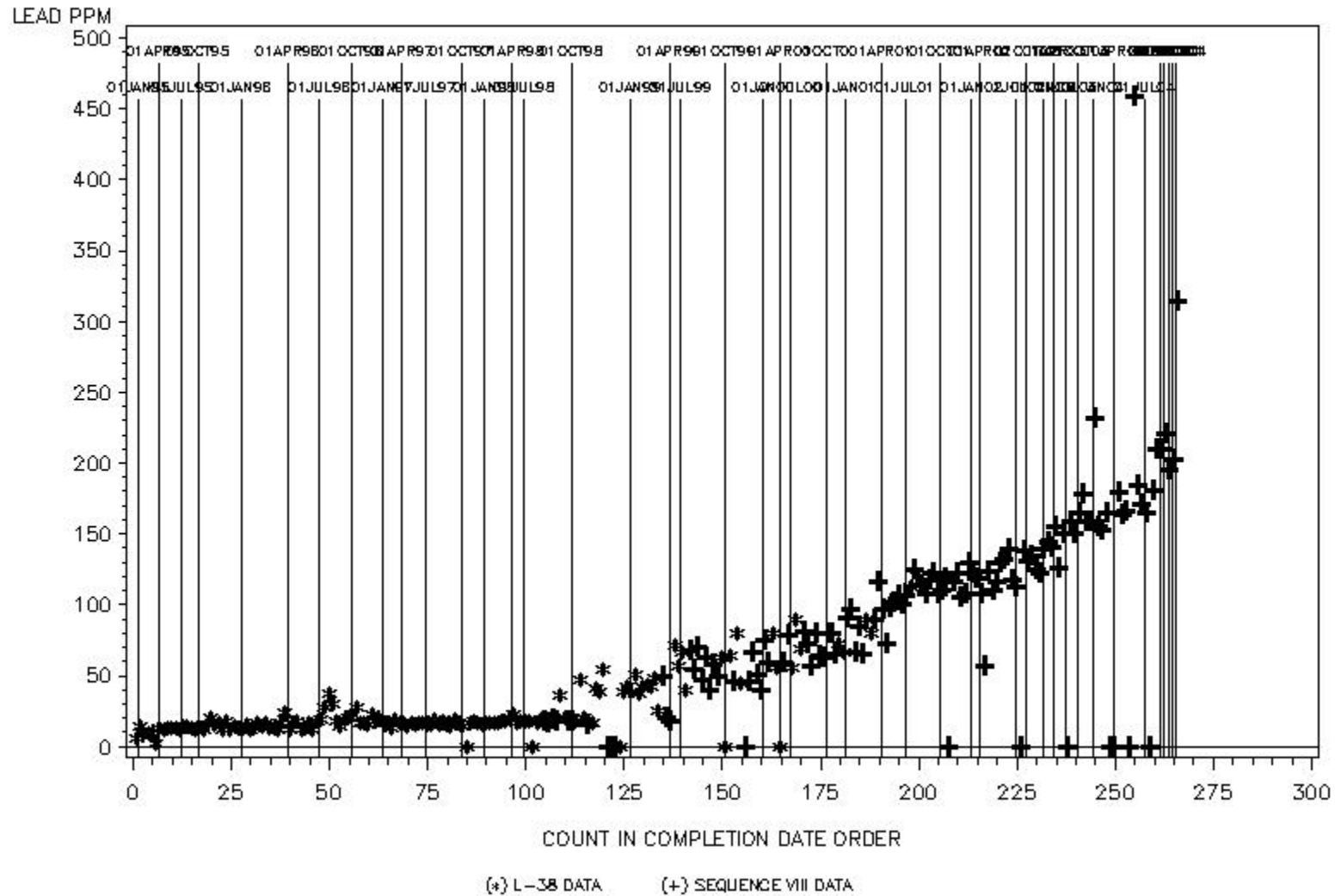


Figure 9 - Sequence VIII Timeline		
Date	Topic	Information Letter
2/10/1999	NEW PISTON RING BATCH APPROVED FOR USE IN SEQUENCE VIII TESTING	00-1
4/16/1999	DRAFT 3.1 OF THE SEQUENCE VIII TEST PROCEDURE ISSUED	99-1
5/19/1999	REMOVAL OF RING BATCH REPORTING REQUIREMENTS	00-1
5/19/1999	NEW OIL FILTER (RAYCOR LFS-62) IMPLEMENTED INTO TESTING	00-1
11/16/1999	TEST ENGINEERING INC. NEW TEST PARTS SUPPLIER	00-1
1/28/2000	PISTON CLEANING PROCEDURE FOR REUSING PISTONS IN SEQUENCE VIII TESTING	00-1
6/15/2002	REVISED STAY-IN-GRADE PROCEDURE IMPLEMENTED	02-1
11/18/2002	EDITORIAL REVISIONS TO D6709-01	02-2
1/1/2004	New MINIERAL SPIRITIS SPECIFICATION	03-1
1/26/04	BILLET CRANKSHAFT APPROVED FOR USE IN SEQUENCE VIII TESTING	
12/9/2004	CLARIFIED SOLVENT SPECIFICATION	04-1
12/9/2004	REVISED FUEL FLOW SPECIFICATION	04-1
12/9/2004	REQUIREMENTS FOR BUILDS WITH OVERSIZE PISTONS	04-1