




Test Monitoring Center

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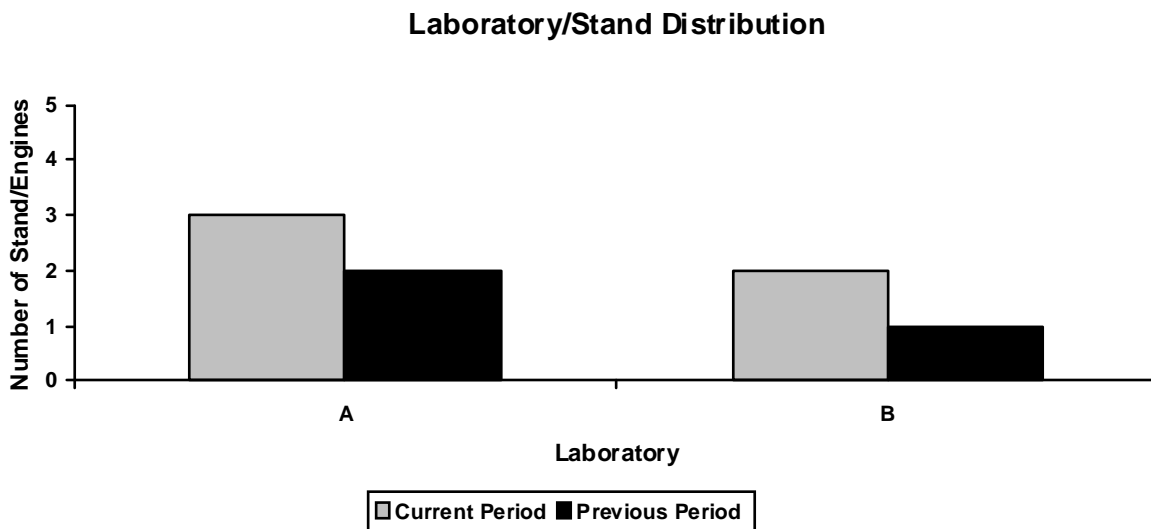
Memorandum: 10-004
Date: April 5, 2010
To: Fred Gerhart, Chairman, Sequence VIII Surveillance Panel
From: Richard E. Grundza 
Subject: Sequence VIII Semiannual Report: October 1, 2009 to March 31, 2010

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, 2009 to March 31, 2010.

Lab/Stand Distribution

	Reporting Data	Calibrated as of March 31, 2010
Number of Laboratories:	2	2
Number of Stand/Engine Combinations:	5	5

The following chart shows the laboratory/stand distribution:

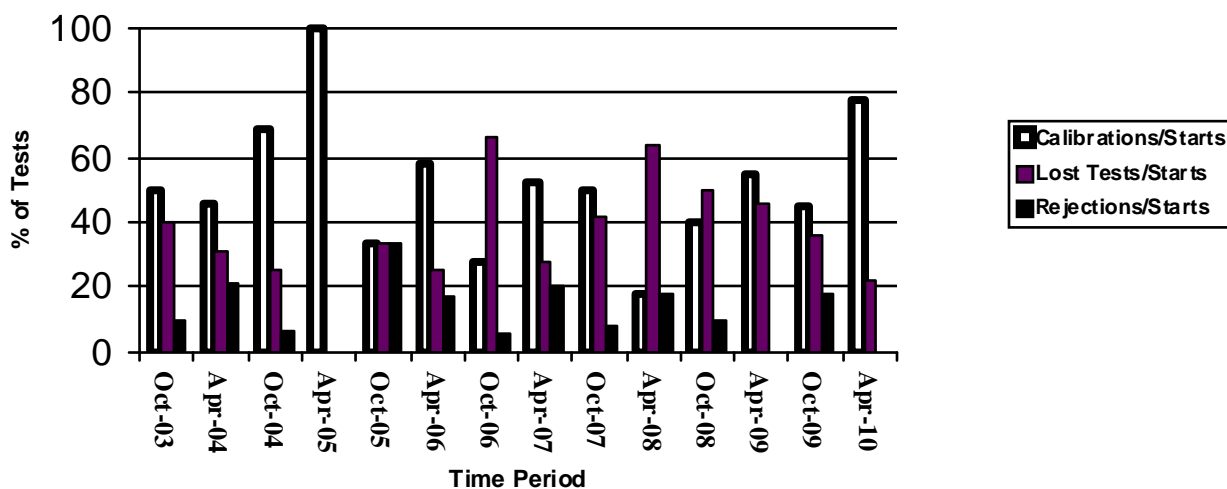


The following summarizes the status of the reference oil tests reported to the TMC:

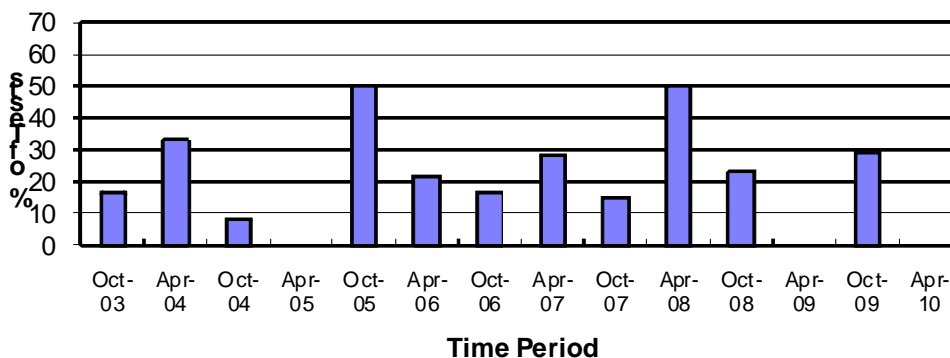
Calibration Start Outcomes	TMC Validity Code	No. of Tests
Operationally and statistically acceptable	AC	7
Operationally invalid (laboratory judgment)	LC	2
Total		9

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

Calibration Attempt Summary



Rejected Operationally Valid Tests



There were no failing tests this report period.

There were no LTMS Deviations this period. There have been three deviations from the LTMS to date.

One lab visit was conducted by the TMC this period. No discrepancies were noted during this visit.

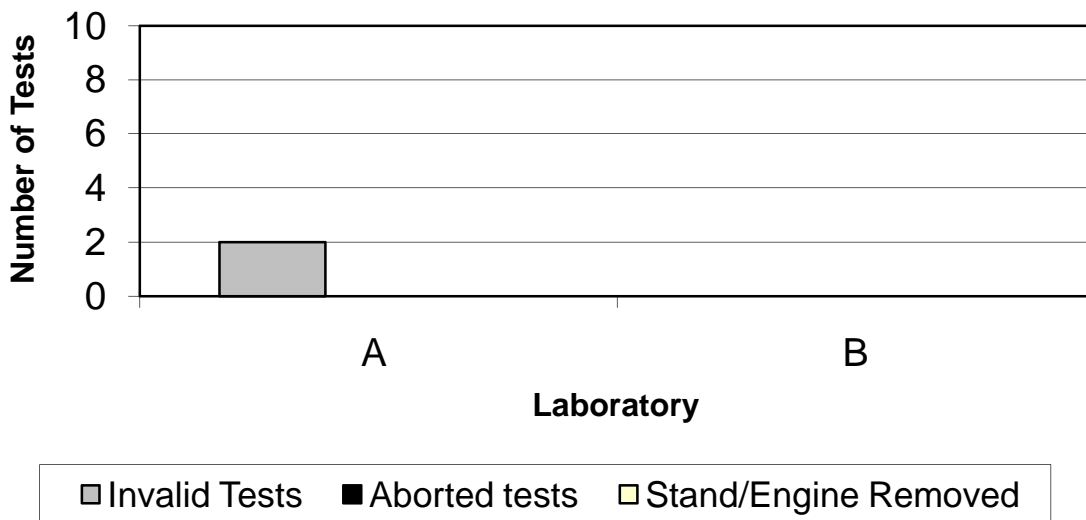
Lost Test Summary

Two tests were lost this period. The reasons for the lost tests are tabulated below:

Reasons for Lost Test(s)	Number
High mechanical wear	1
Fuel flow deviation percentage out of limit	1

Aborts and operationally invalid tests, reported by laboratory, are summarized in the following chart:

Lost Test Distribution



Information Letters

One information letter was issued this period. Information Letter 09-2 was issued 11-18-2009. Item(s) changed with this information letter are documented in the VIII timeline (Table 7).

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 values 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	0.843	3.78 (df=5)	3.19 mg
SVIS	0.673	0.111 (df=5)	0.07 cSt

Average Δ/s by Laboratory		
Lab	BWL	SVIS
A	1.271	0.789
B	0.272	0.519

Bearing Weight Loss (BWL)

The industry control charts for severity began the period in control, but were in severity warning or action alarm for most of the period. With the exception of a warning at the beginning of the period, precision charts were in control for the period (see Figure 1).

The Industry BWL mean Δ/s is 0.843 severe for this report period (see Figure 3). This equates to a shift of 3.18 mg in reported units. The pooled standard deviation for the period is 3.78 mg (see Figure 4), which has improved with respect to the previous period and compares well with historical estimates.

Stripped Viscosity (SVIS)

The industry control chart for severity began the period in control, but went into mild warning alarm with the last four tests reported during the period. Precision was in control for the period (see Figure 2).

The Industry SVIS mean Δ/s is 0.673 mild for this report period (see Figure 5), and equates to a shift of 0.07 cSt in reported units. The pooled standard deviation for the period is 0.111 cSt (see Figure 6), which has degraded with respect to the previous period and is comparable to historical performance.

Hardware

01-09 bearings were run exclusively for calibration test this period.

TMC Memoranda

No TMC Memoranda were generated this report period.

Reference Oils

Oil	TMC Inventory, In gallons	TMC Inventory, In tests	Laboratory Inventory, in tests	Estimated Life
704-1	242	121	3	5+ years
1006	41	20	1	3 months ¹
1006-2	3995	1,998	5	3+ years ¹
1009	533	266	3	3+ years ¹

¹ Multiple test area reference oil; total TMC inventory shown

REG/reg

Attachments

c: J. A. Clark, TMC

Sequence VIII Surveillance Panel

<ftp://ftp.astmtmc.cmu.edu/docs/gas/sequenceviii/semiannualreports/VIII-04-2010.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 is the Sequence VIII Timeline, created to track changes in test hardware and operations.

Figure 1
SEQUENCE VIII INDUSTRY OPERATIONALLY VALID DATA

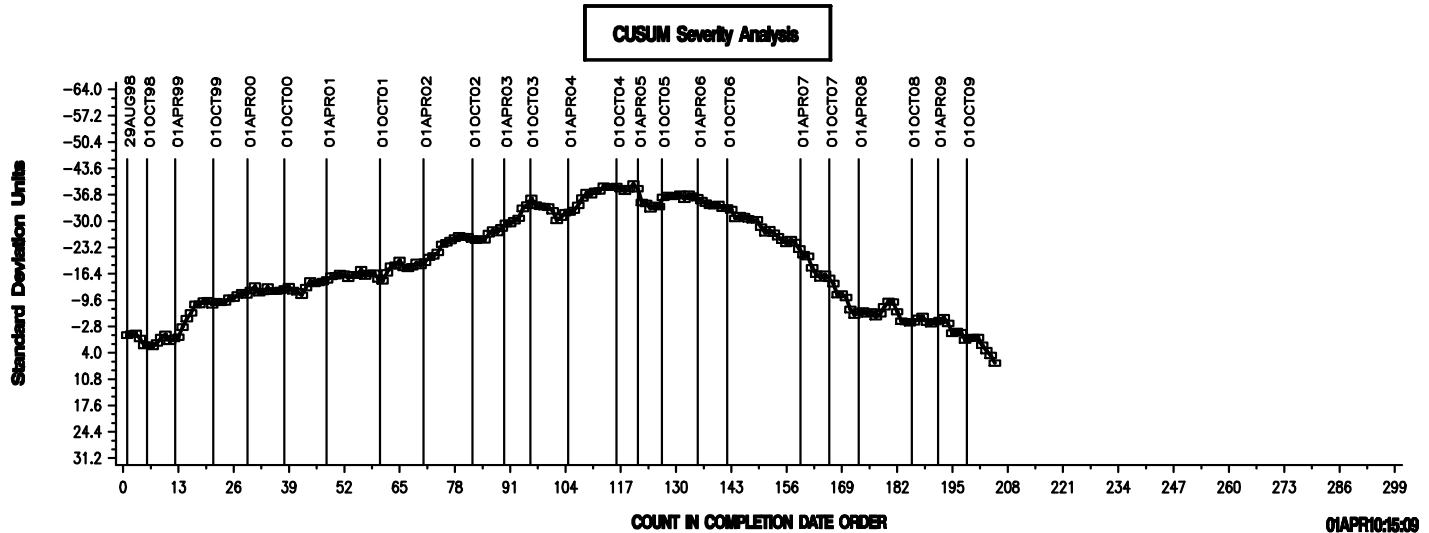
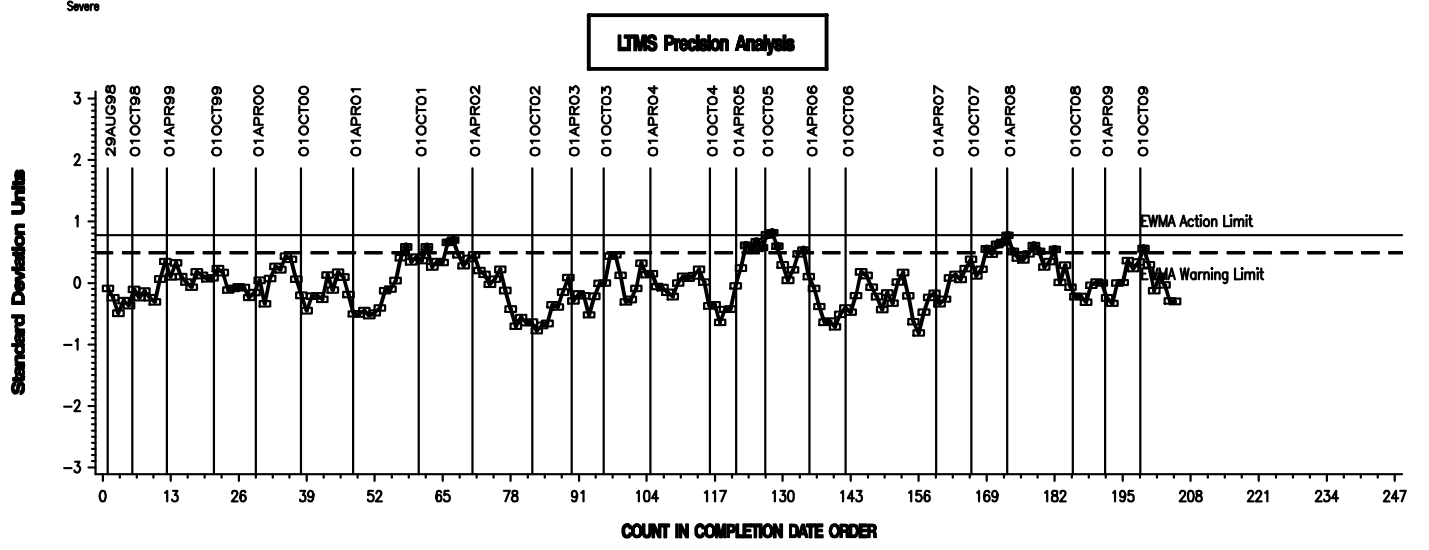
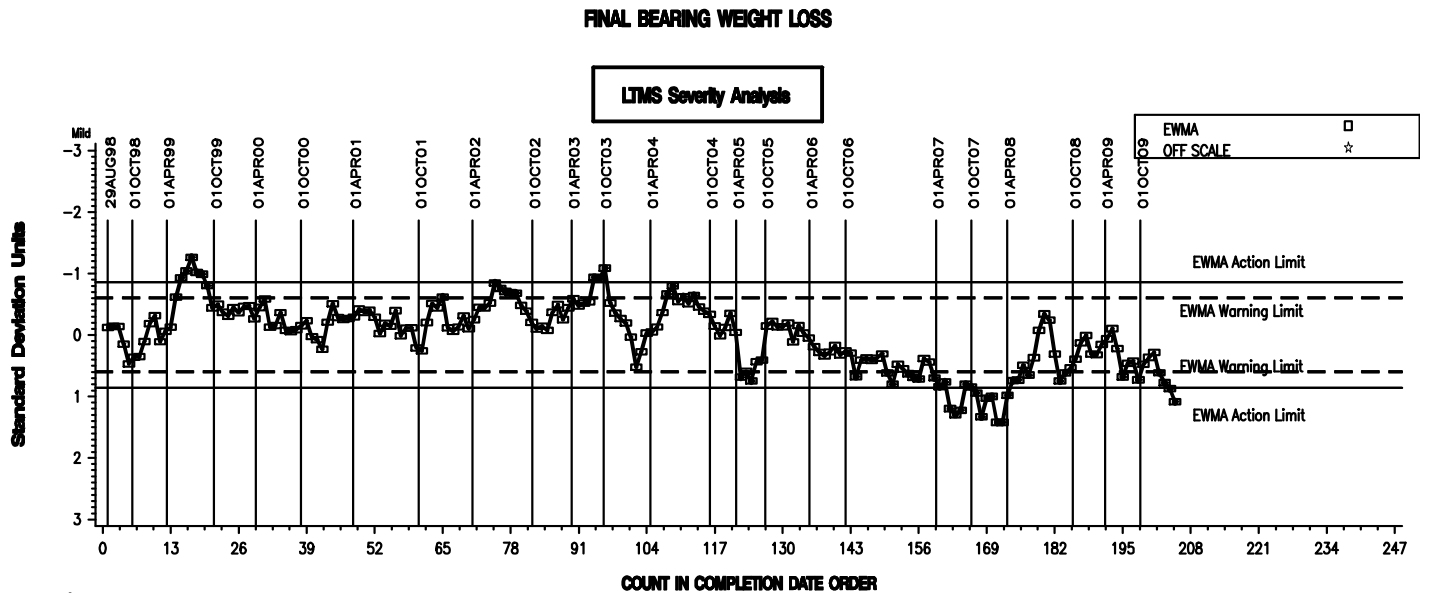
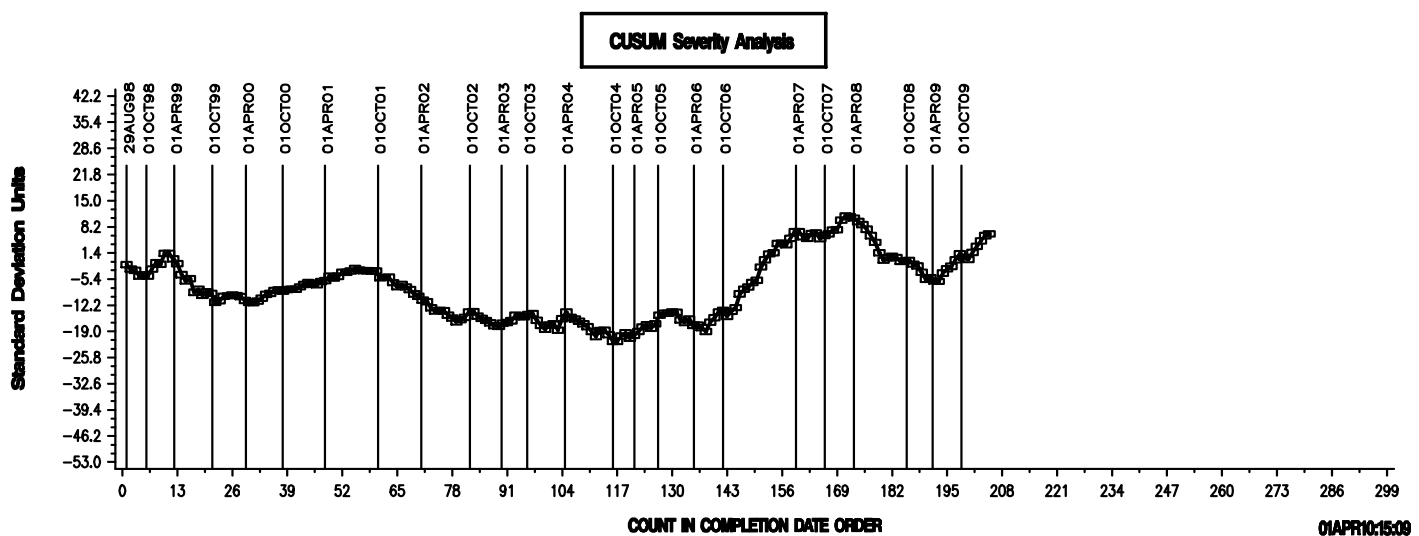
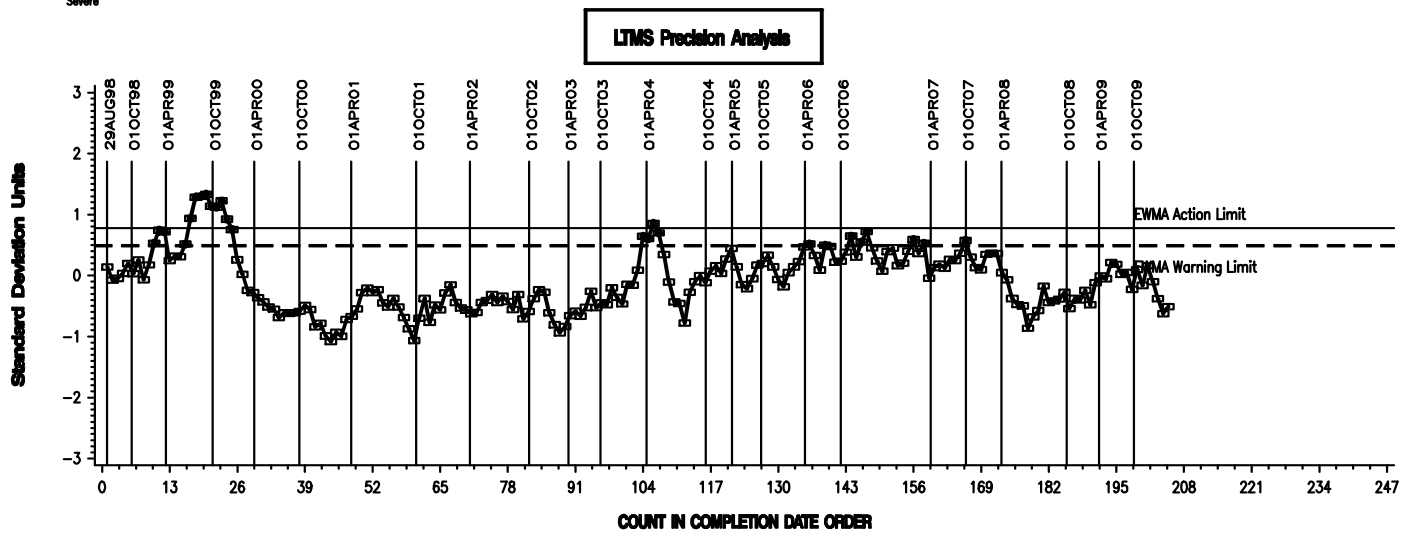
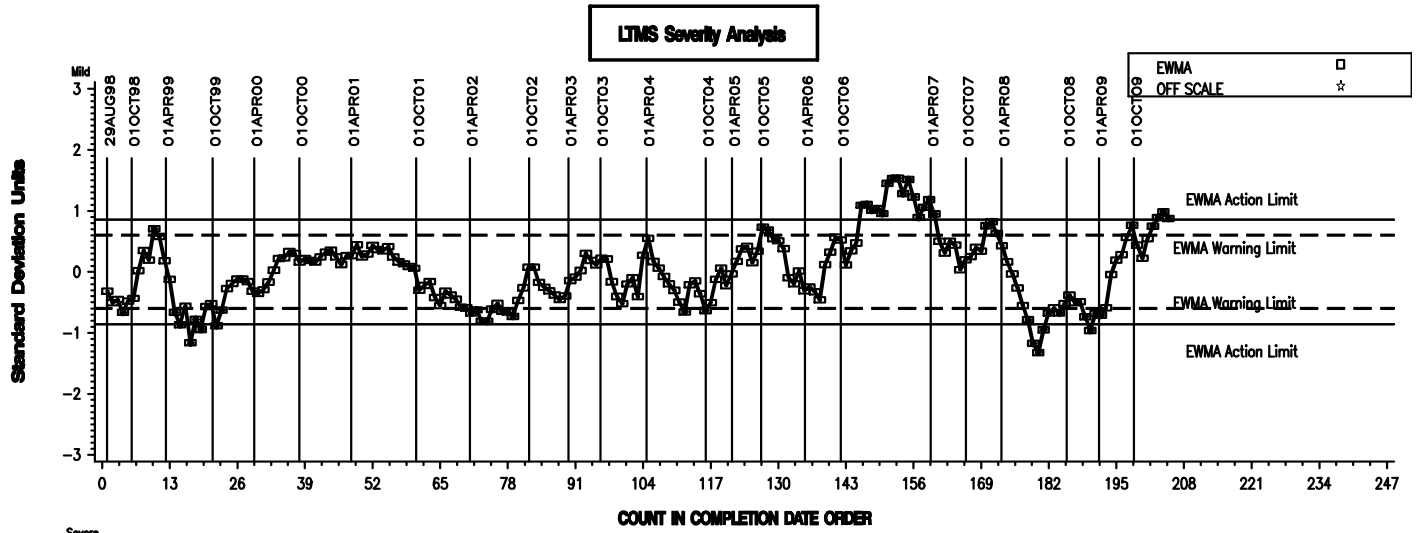


Figure 2
SEQUENCE VIII INDUSTRY OPERATIONALLY VALID DATA

STRIPPED VIS. @ 100 DEG C



**Figure 3 - Sequence VIII Reference Oil Data
Bearing Weight loss**

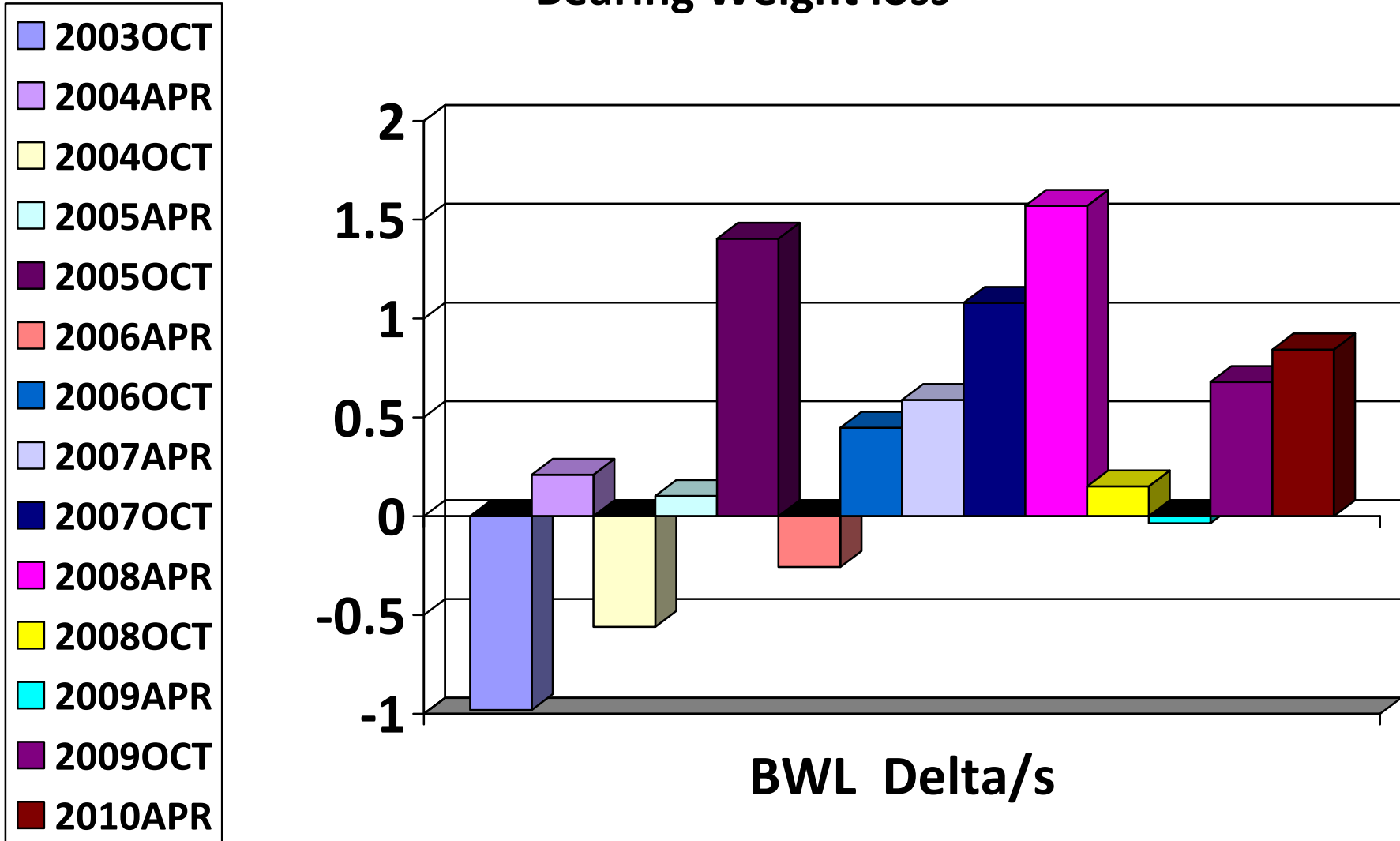
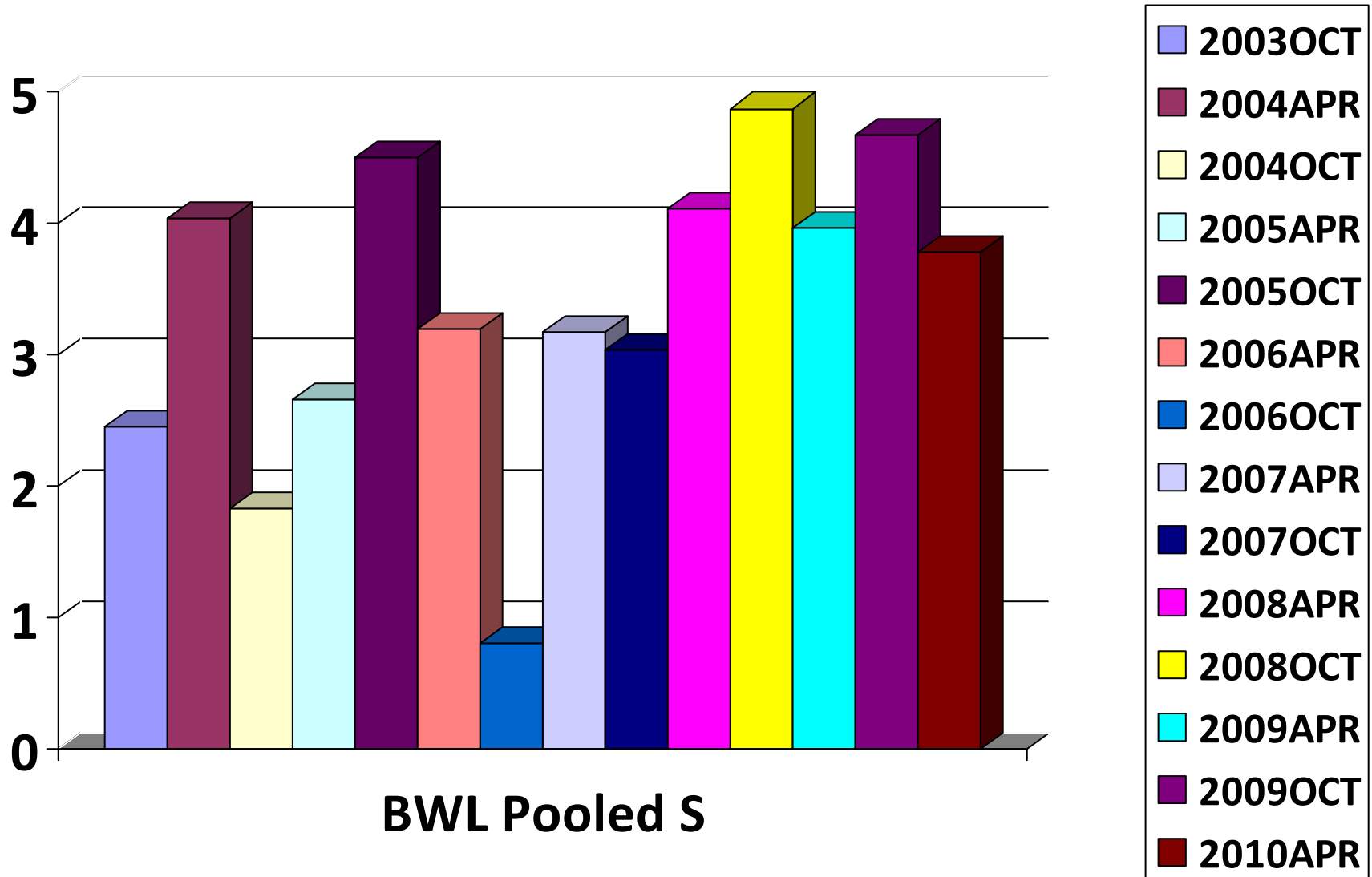
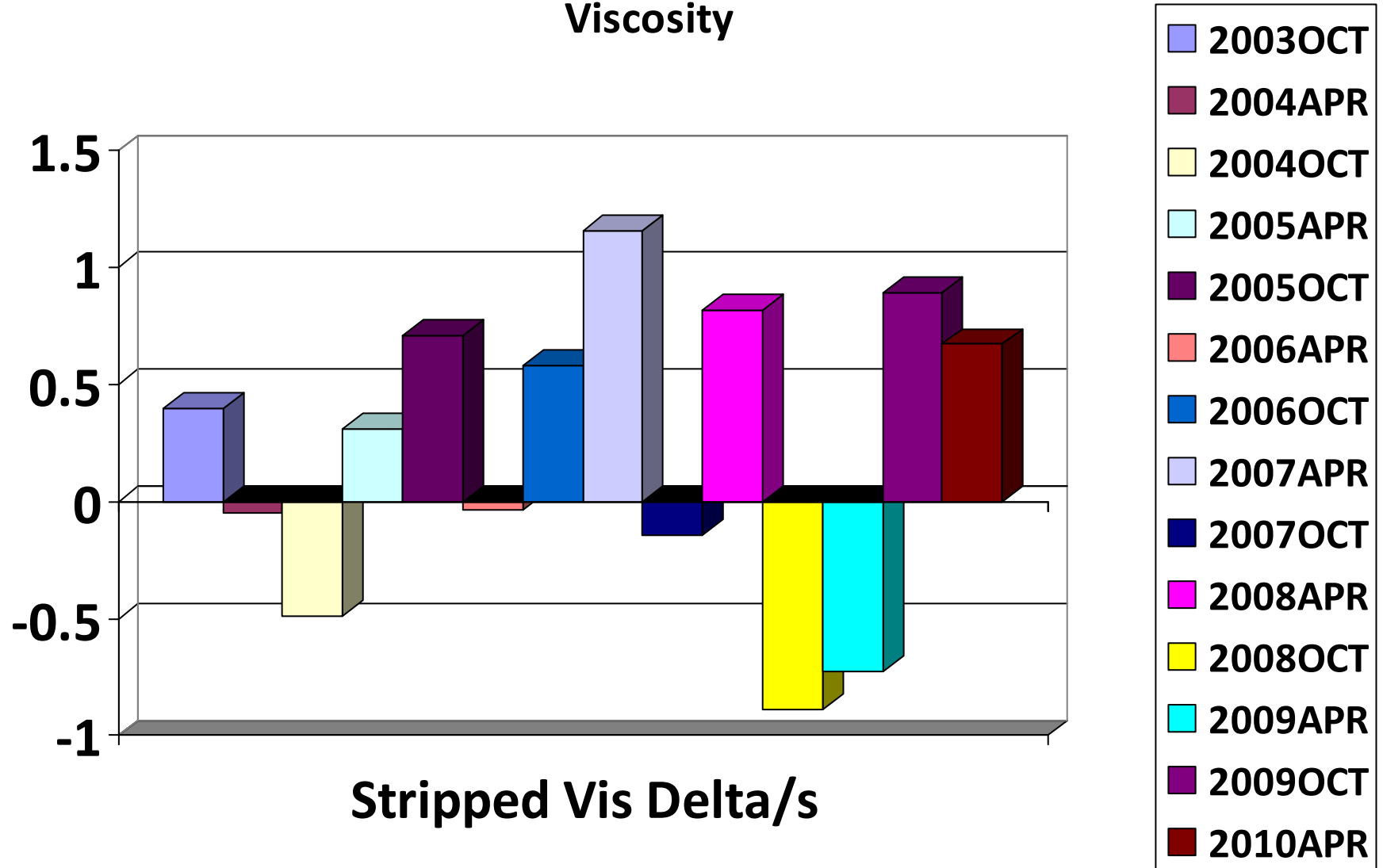


Figure 4 Sequence VIII Reference Oil Data Bearing Weight Loss



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



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

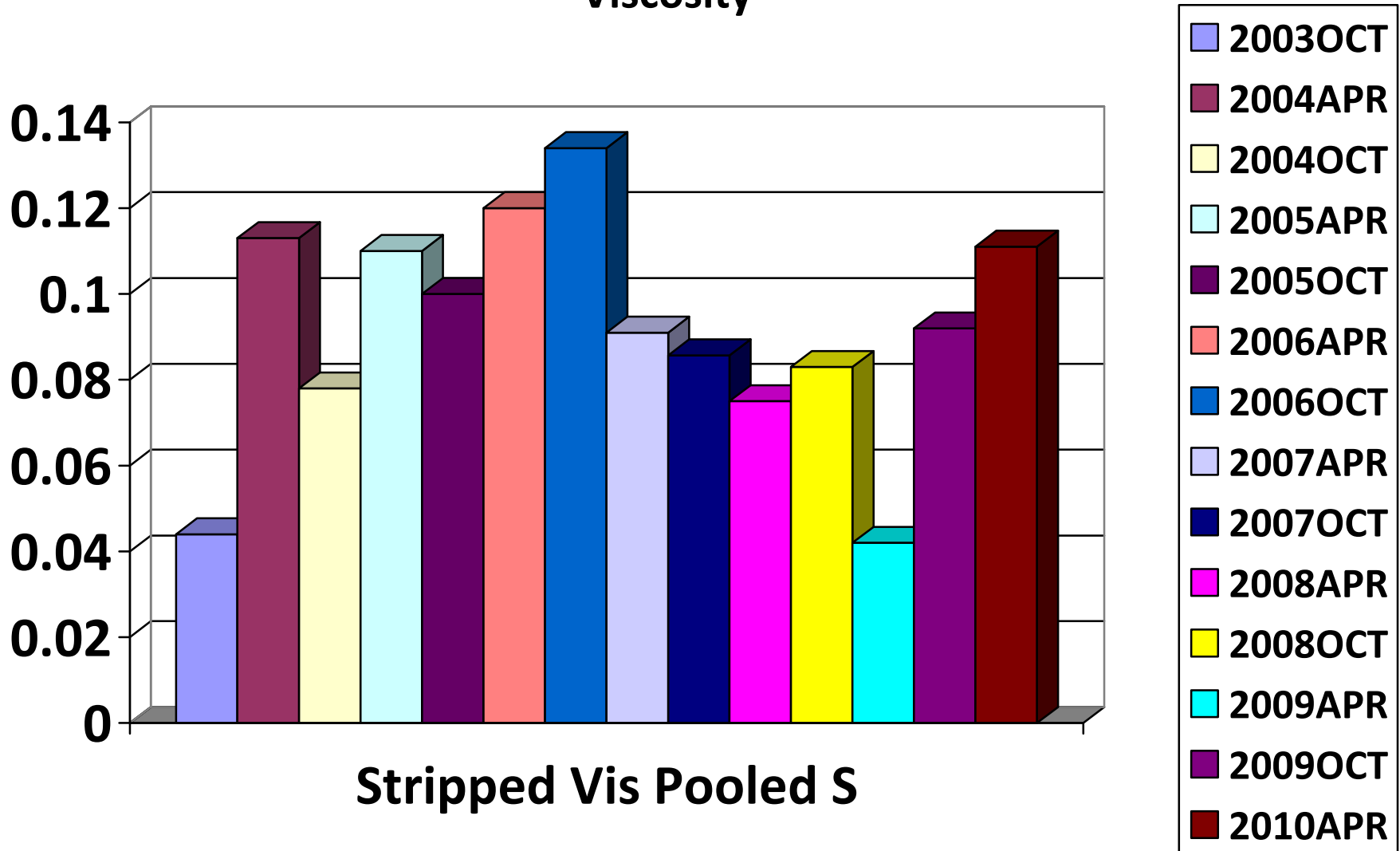


Figure 7 - Sequence VIII Timeline

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	NEWINERAL SPIRITS 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
6/23/05	DELETED ROCKER COVER INLET TEMPERATURE AND PRESSURE SENSORS, UPDATED PRECISION STATEMENT	05-1
9/20/06	FIRST TEST ON 03-06 BEARINGS	
10/24/06	REVISED BEARING CLEANING PROCEDURE IN ANNEX A9	06-1
3/12/07	TARGET UPDATE, REFERENCE OIL 1006-2	
5/15/08	ADDED RESERVIOR TO ROCKER COVER INLET	08-1
6/12/08	CLARIFIED HARDWARE REUSE GUIDELINES	08-2
5/28/09	DELETED REQUIREMENT TO SEND HARD COPY REPORT TO TMC	09-1
5/28/09	ADDED REQUIREMENT TO REPORT ALL RESULTS FROM REFERNCE OIL TESTS TO TMC	09-1
11/18/09	ADDED RACOR HOUSING LFS-55 TO TEST METHOD	09-2