

Sequence V Surveillance Panel Meeting
October 24, 2019 10 AM Eastern

Roll Call:

Afton: B. Maddock, B. Campbell

Ford: R. Romano

GM: B. Cosgrove

Haltermann: P. Tamati

Infineum: D.Boese, A.Ritchie, C. Leverett

Intertek: A. Lopez, M. Chadwick

Lubrizol: J. Brys,

OHT: M Bowden

Oronite: J. Martinez

Shell: J. Hsu

SwRI: A.Chaudrey , D. Eckstrom, T. Kostan

TEI: D. Lanctot

TMC: Rich Grundza

Valvoline: Amol Savant

PSL Services: Chris Taylor.

Membership Changes:

- Ben Maddock to replace Ed Altman for Afton
- Daniel Engstrom to replace Ankit Chaudhry for SwRI

Chairman's Comments: The main topic for this call was to discuss the recent mild sludge reference oil results on 1009-1.

Background: The reblend of 1009 coded 1009-1, has 5 reported test results from 3 labs; the 3 most recent tests are mild on sludge while 2 tests run in Aug. 2018 and Aug 2019 are on target. 1009 was introduced in 2002 and 1009-1 is the first reblend of it. (One of the on target 1009-1 results ran on the previous fuel batch.) As a result, the 3 labs which ran 1009-1 have attained very significant mild laboratory SAs. Todd Dvorak commented that the TMC reported Calcium levels of 1009-1 appeared to be much lower than 1009 and suggested blend differences (1009 vs 1009-1) which might account for the different performance of the oils in the VH. TMC agreed to look into this further and report back its findings to the panel.

Travis Kostan commented that there was a recent mild 940 result at one of the labs which also reported a 1009-1 mild result, and that perhaps we were addressing the possibility that the VH test had gone mild rather than that 1009-1 alone was mild (versus 1009)

IAR Presentation: Martin Chadwick of Intertek went over the suggestions from IAR on how to handle the recent mild results as follows:

1. Suspend issuing 1009-1 to the labs.
2. Remove all past 1009-1 runs from the lab charts and recalculate severity adjustments effective immediately.
 - a. In order to be effective immediately the SP would need to agree this was an emergency LTMS update otherwise it needs to wait two weeks.
3. Agree that the immediate update is to lab severity adjustments only. No changes will be made to current lab or stand calibration. The goal is to minimize the potential impact to candidates since we cannot be sure what the correct SA's using 1009-1 are but we don't think the oil is so far off that it needs to change calibration status in a lab based system.
4. Each calibrated lab will donate a valid 1009-1 test conducted immediately after the next acceptable reference in the lab on the stand that ran the acceptable reference.
 - a. This is a donated test and will only get the one run and time added to the calibration interval. It will not go into the charts.
5. Once all donated tests are completed the 1009-1 data will be reviewed to determine if it is significantly different from 1009.
 - a. If it is different.
 - i. The oil can be discarded and another re-blend requested. In that case the LTMS charts would continue with 1009-1 data removed.
 - ii. The 1009-1 targets can be adjusted. In that case the 1009-1 runs from the past will be returned to the charts and recalculated with the new targets at the next reference in each lab and 1009-1 will be returned to the normal RO rotation.
 - b. If it is not different then 1009-1 runs from the past will be returned to the charts and recalculated with the 1009 targets at the next reference in each lab and 1009-1 will be returned to the normal RO rotation.

He noted that similar things have been done with other ASTM tests and that this approach helps in the following manner:

1. Historically we do not change past candidates and this continues that. However if the industry decides to adjust past candidates then the effective date of the SA update could be revised to reflect that.
2. This ensures SA's from oils with known good targets are only being used to adjust candidates as quickly as possible.
3. Maintaining current calibration status means labs are not further penalized by the "luck of the draw" from past oil assignments.
4. Donated tests ensure all labs participate in the oil evaluation process and avoids a "double or nothing" attitude that awarding a full interval if it is "acceptable" after analysis gives that can influence future decision making.
5. Donated tests and LTMS recalculation after the next reference provide labs some control over the changes.

Discussion:

The group discussed when the labs expected to run their next reference tests. These are projected to run in the November 2019 – January 2020 timeframe. The subject of early referencing on 1009-1 was discussed and became the subject of Motion #2 below. Questions were raised around the possibility of fuel degradation being responsible for the mild sludge trend, but the fuel supplier has no fuel analytical data to support this statement.

TMC reported that there could be enough of the original 1009 blend to run as a reference and that they would investigate this further and report back on the remaining 1009 inventory.

Following these discussions the following 2 motions were made and passed;

MOTION #1

1. Suspend issuing 1009-1 to the labs.
2. Remove all past 1009-1 runs from the lab charts and recalculate severity adjustments effective immediately.
3. Agree that the immediate update is to lab severity adjustments only. No changes will be made to current lab or stand calibration.]

Martin Chadwick/Jerry Brys

Passed: 9 Approved, 0 Disapproved and 4 Waives

MOTION #2

Allow TMC to adjust references (extend reference periods for early reference tests) to obtain additional data on 1009-1.

Martin Chadwick/Ron Romano

Passed: 13 Approved, 0 Disapproved and 0 Waives

Action Item #1: With regards to the concerns raised about the reported discrepancies in the Calcium values for 1009 and 1009-1, Rich will review the TMC records and summarize the data.

Action Item #2: Rich to see how much 1009 oil was available.

Action Item #3: Rich to review LTMS data to see if there is a difference between stands within the lab.

Next meeting: At the call of the Chairman but within a few weeks

Meeting Adjourned 11:10 ET.

Sequence VH S.P. Recent Results, 1009-1

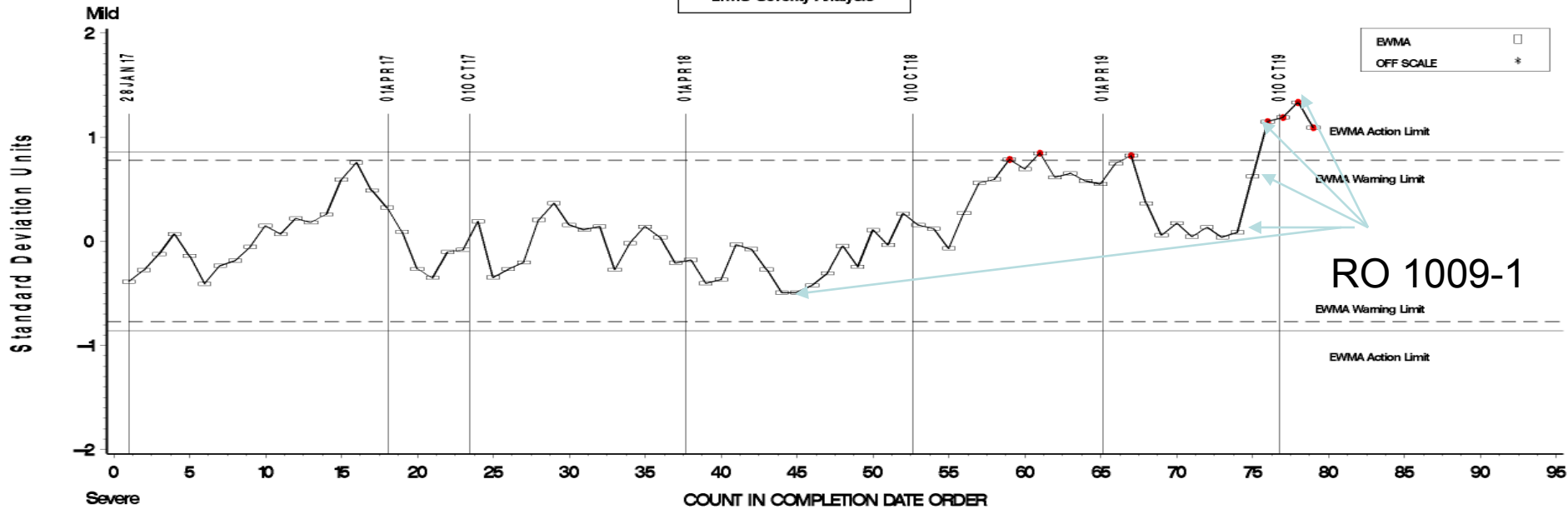
Prepared By: Richard E. Grundza

1009-1 Reblend

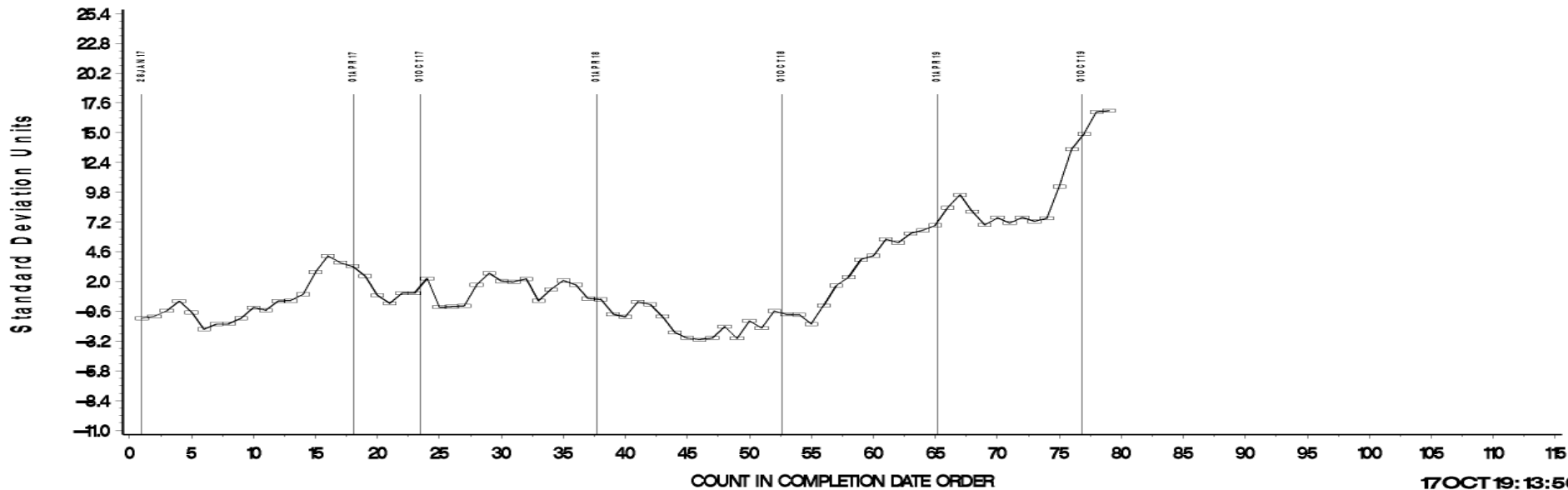
- Recent tests on blend of 1009 (1009-1) have been mild of target (2.77, 3.25 & 1.91 s Mild) for AES. Previous two results were close to target. 4 of last 5 on fuel batch GI0321NX10
- RAC and AE50 also mild
- AP50 may not be showing same trends.

AVERAGE ENGINE SLUDGE

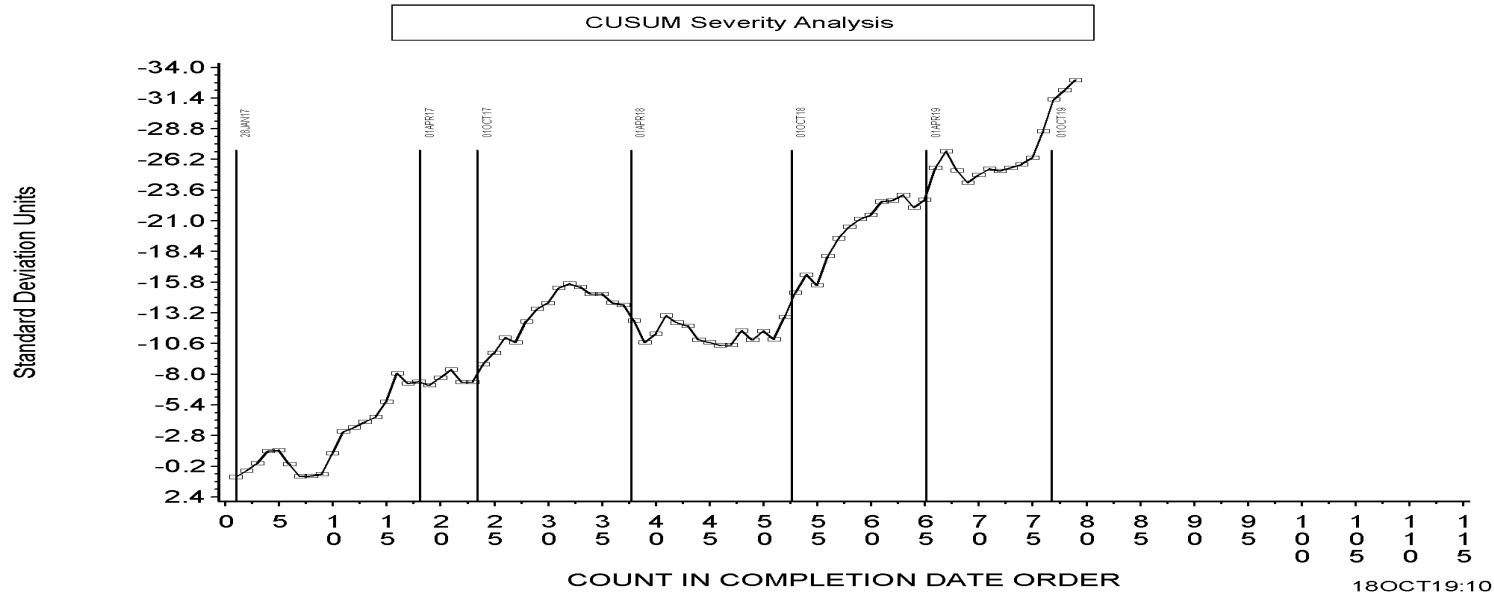
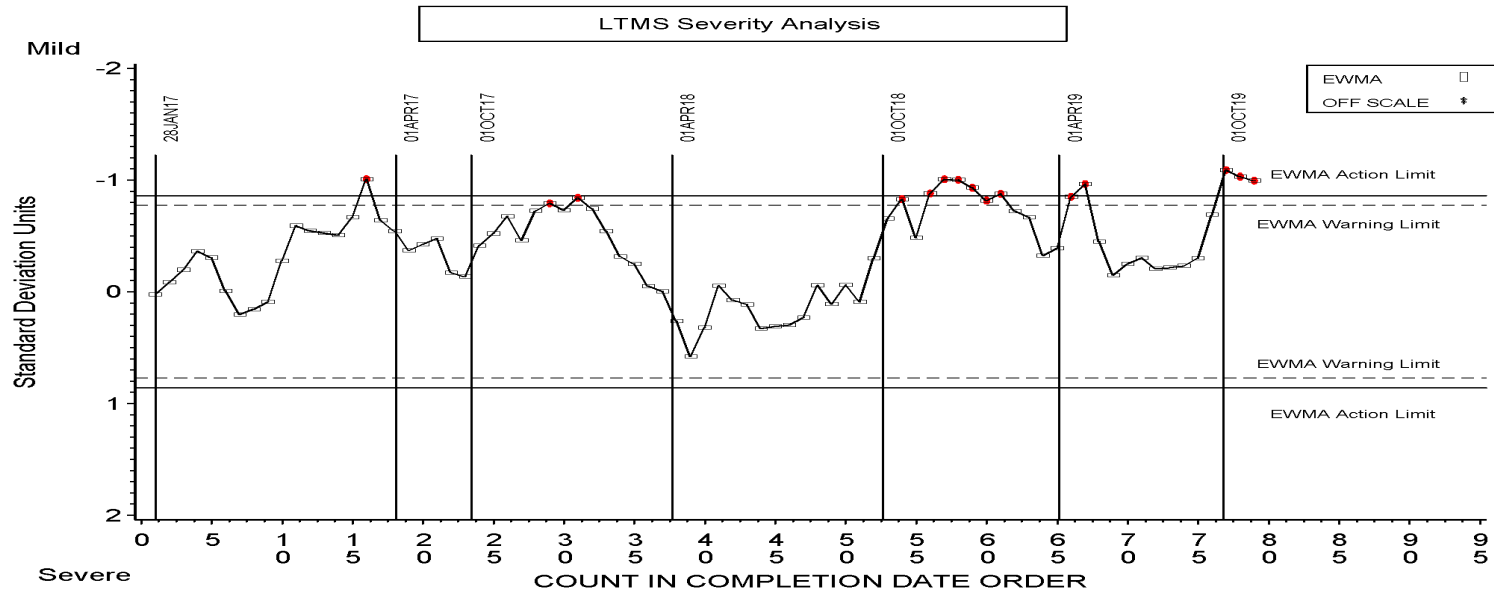
LTMS Severity Analysis



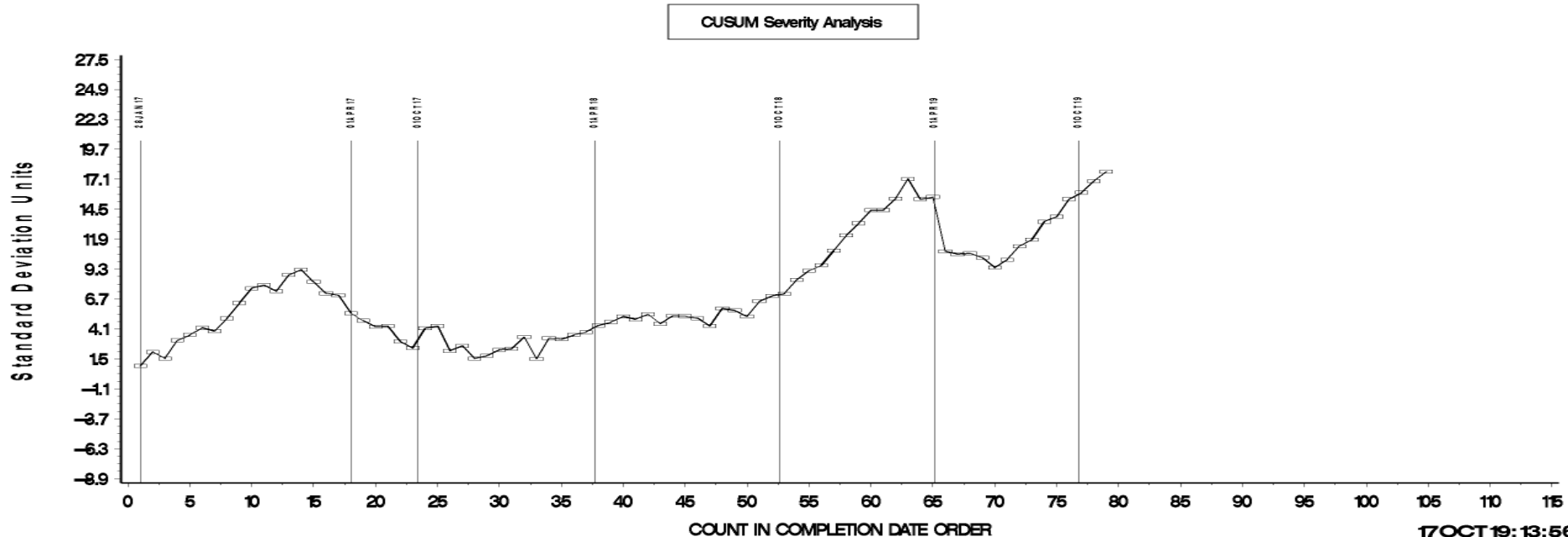
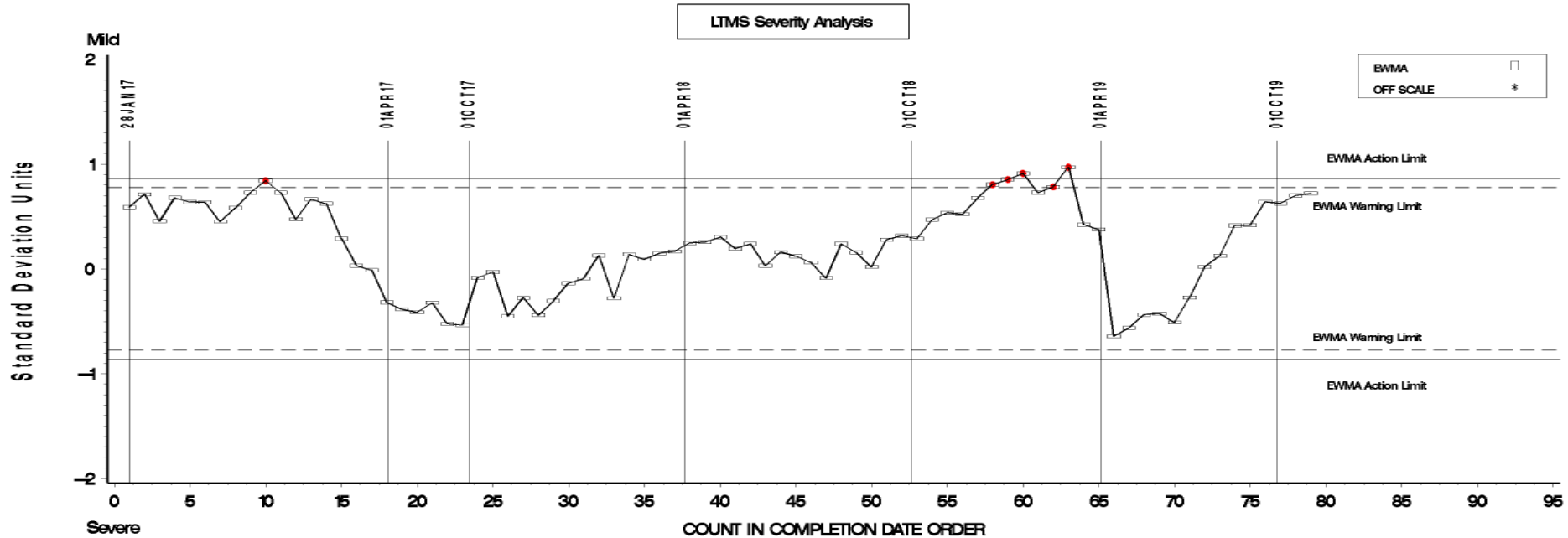
CUSUM Severity Analysis



SEQUENCE VH INDUSTRY OPERATIONALLY VALID DATA AVERAGE ROCKER COVER SLUDGE

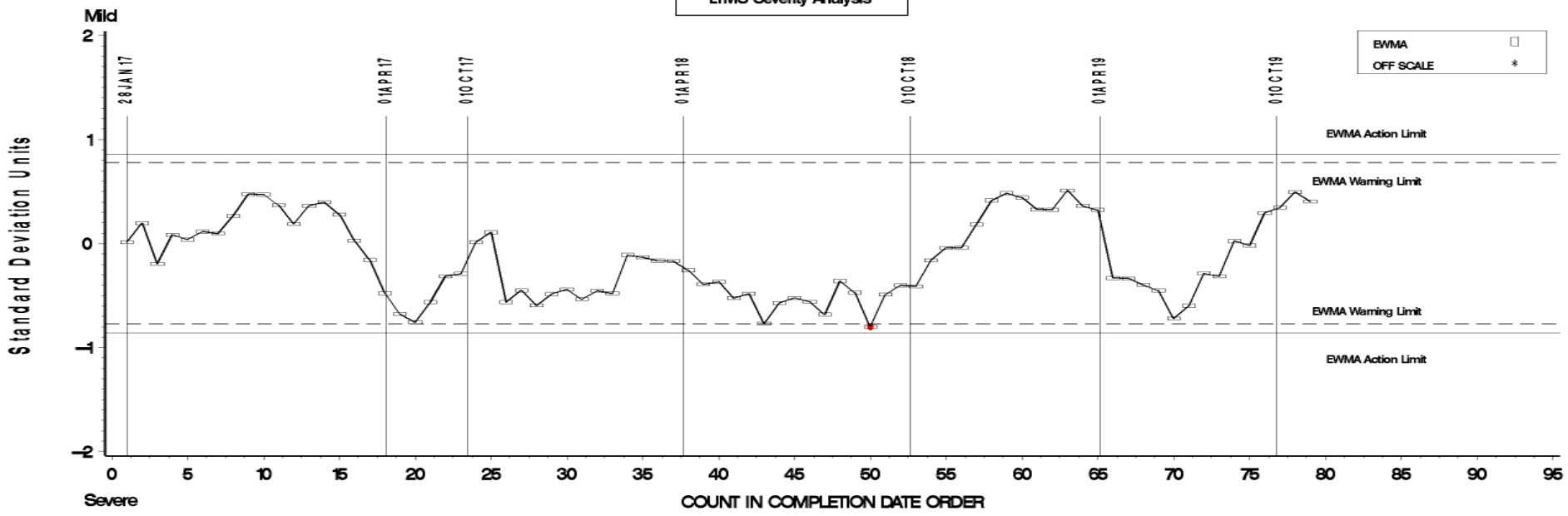


AVG. ENG. VARN. 50% RATING

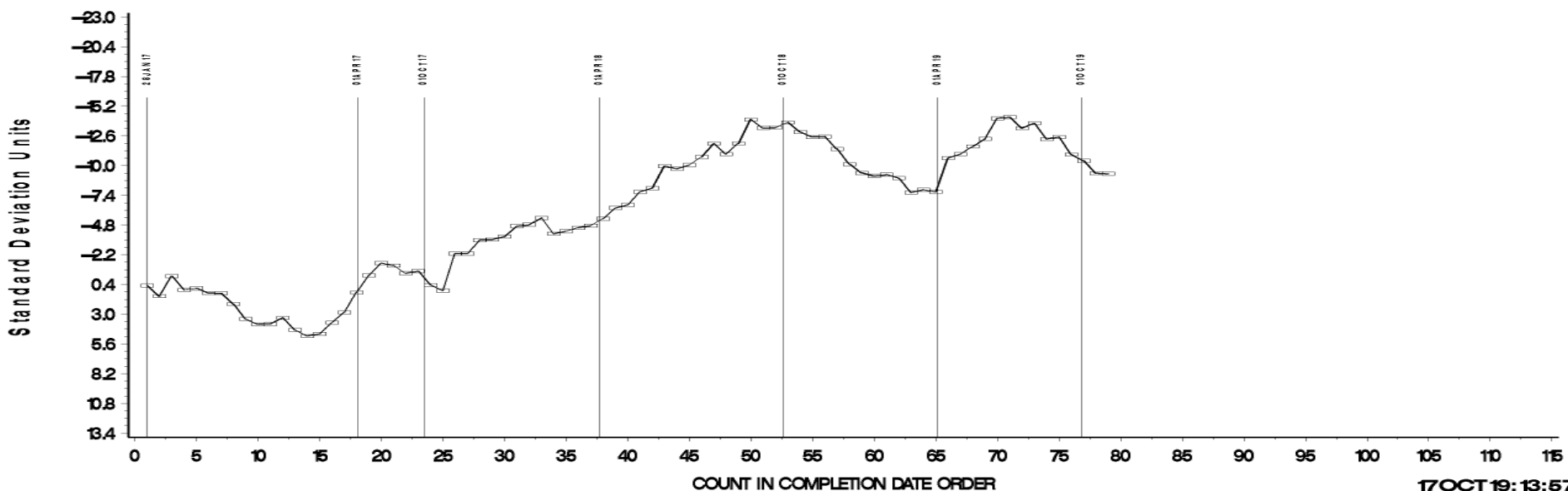


AVG PISTON SKIRT 50% RATING

LTMS Severity Analysis



CUSUM Severity Analysis



Comparison of 1009-1 Yi to lab previous Zi

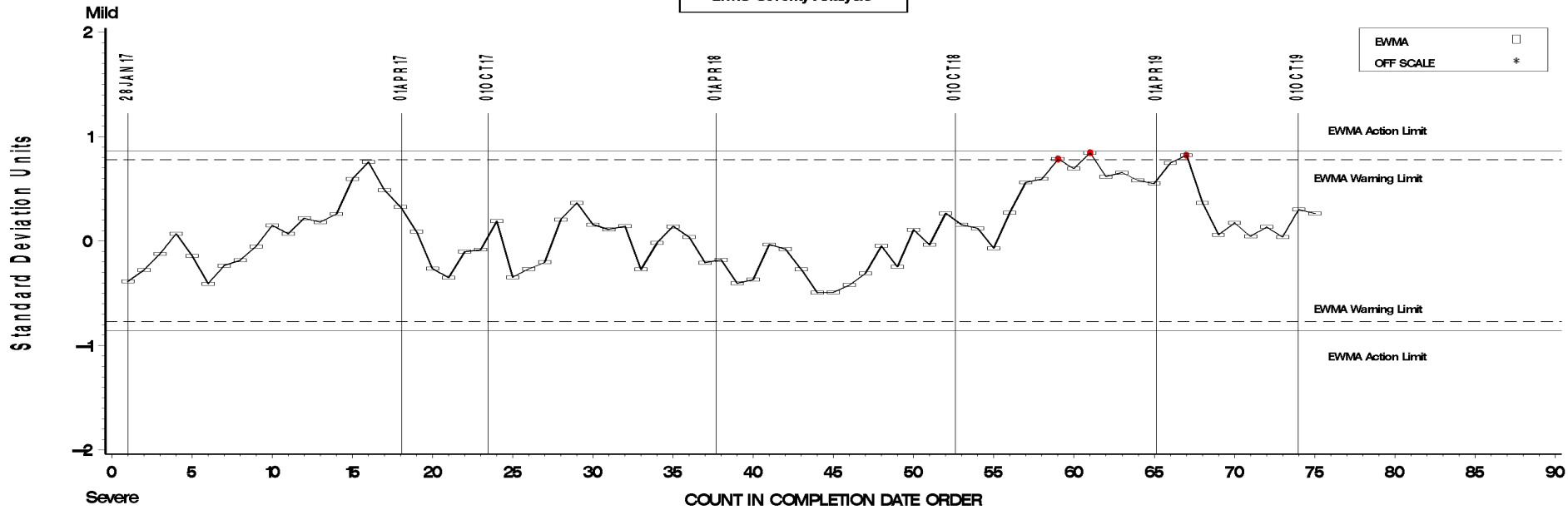
Lab	AES		RAC		AE50		AP50	
	Zi	Yi	Zi	Yi	Zi	Yi	Zi	Yi
A	-0.208	-0.477	-0.004	0.225	0.167	-0.025	-0.169	-0.324
G	0.134	0.273	-0.268	-0.294	0.019	1.575	-0.287	1.378
B	0.822	2.773	-0.965	-0.571	-0.563	0.425	-0.334	-0.189
G	0.086	3.250	-0.233	-2.247	0.415	1.525	0.025	1.540
A	0.174	1.909	-0.250	-0.796	-0.512	1	-0.720	1.095

1009-1 Potential Mild Shift

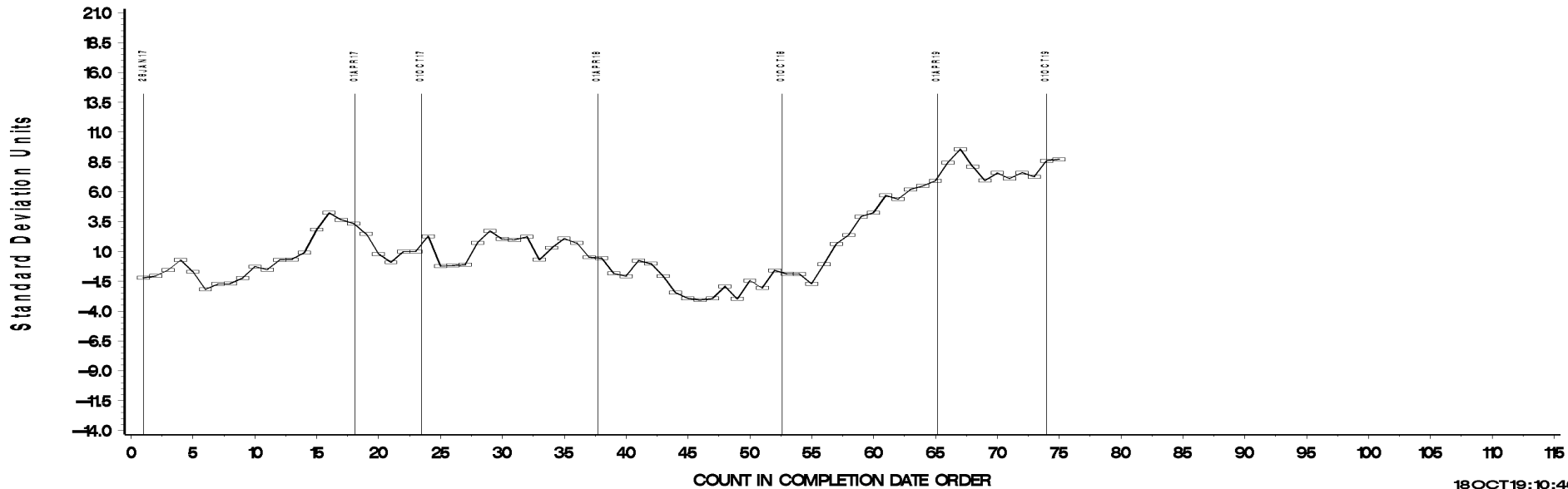
- Lab performance may not account for shift
- Most data on latest fuel batch, one result near target, remaining three are all 2-3 standard deviations mild on AES.
- Next group of industry plots show control charts excluding the last 4 1009-1 results.

AVERAGE ENGINE SLUDGE

LTMS Severity Analysis

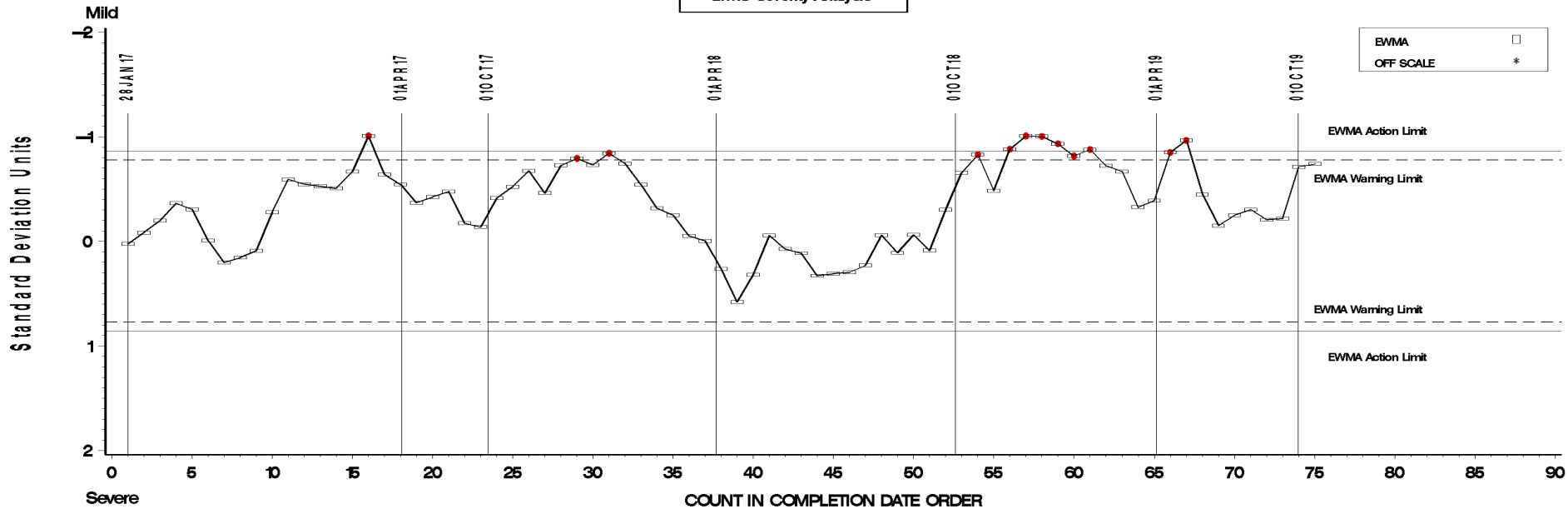


CUSUM Severity Analysis

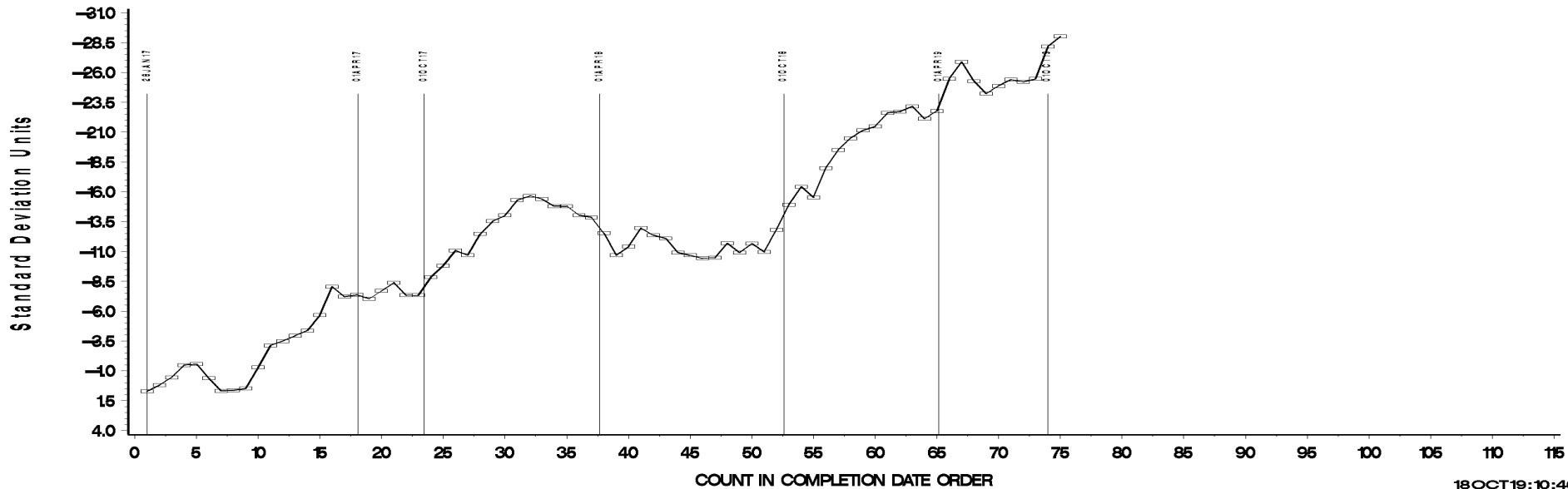


AVERAGE ROCKER COVER SLUDGE

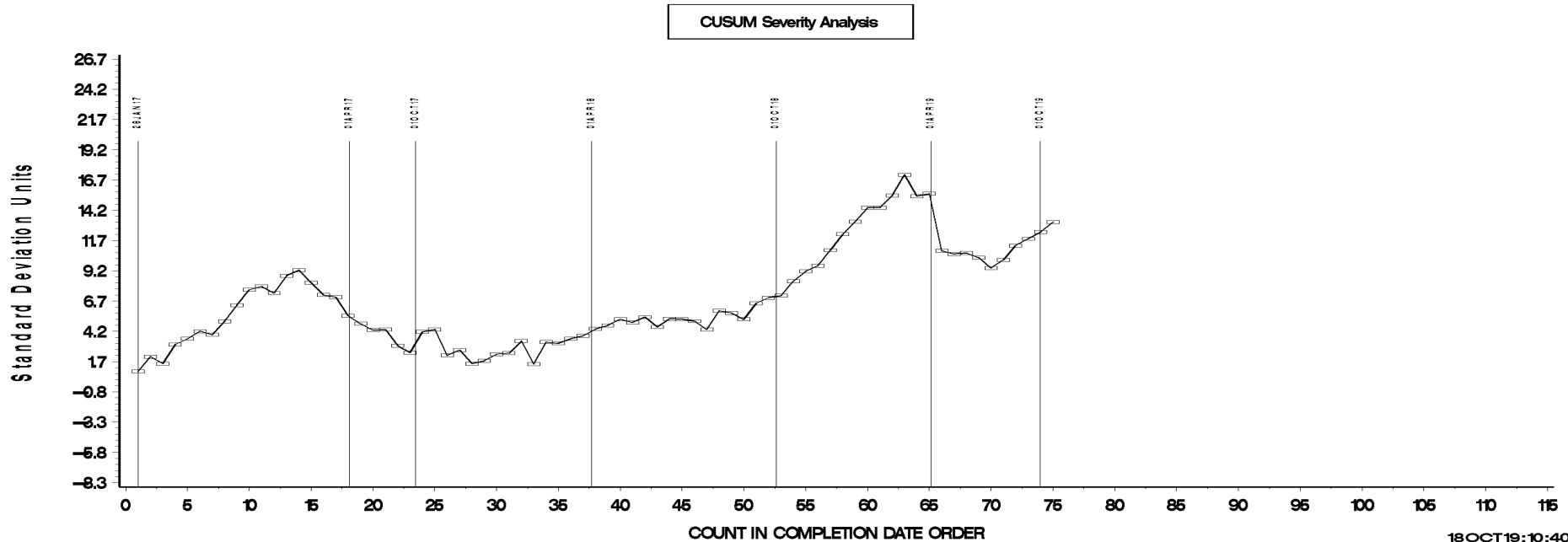
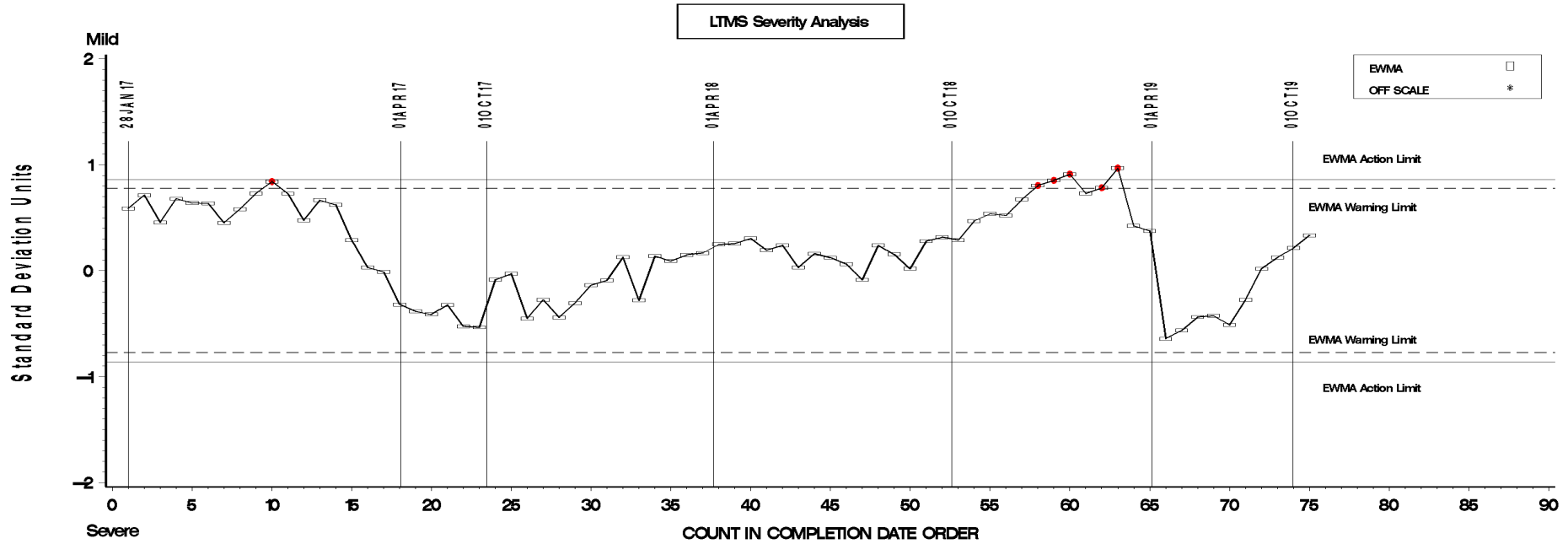
LTMS Severity Analysis



CUSUM Severity Analysis

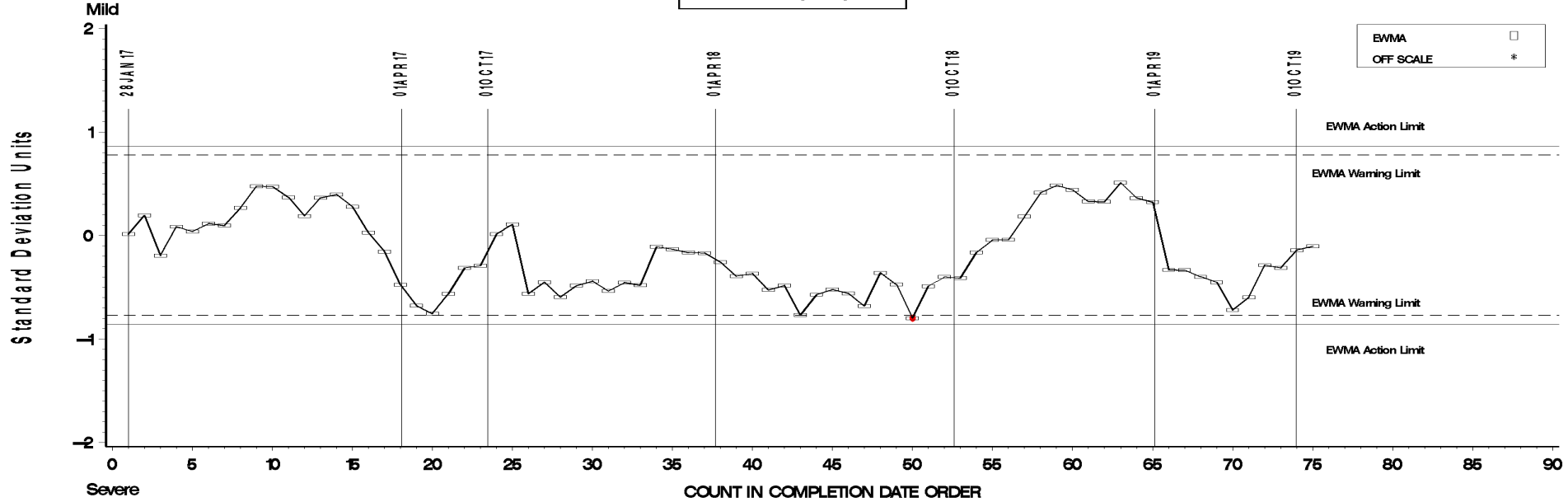


AVG. ENG. VARN. 50% RATING

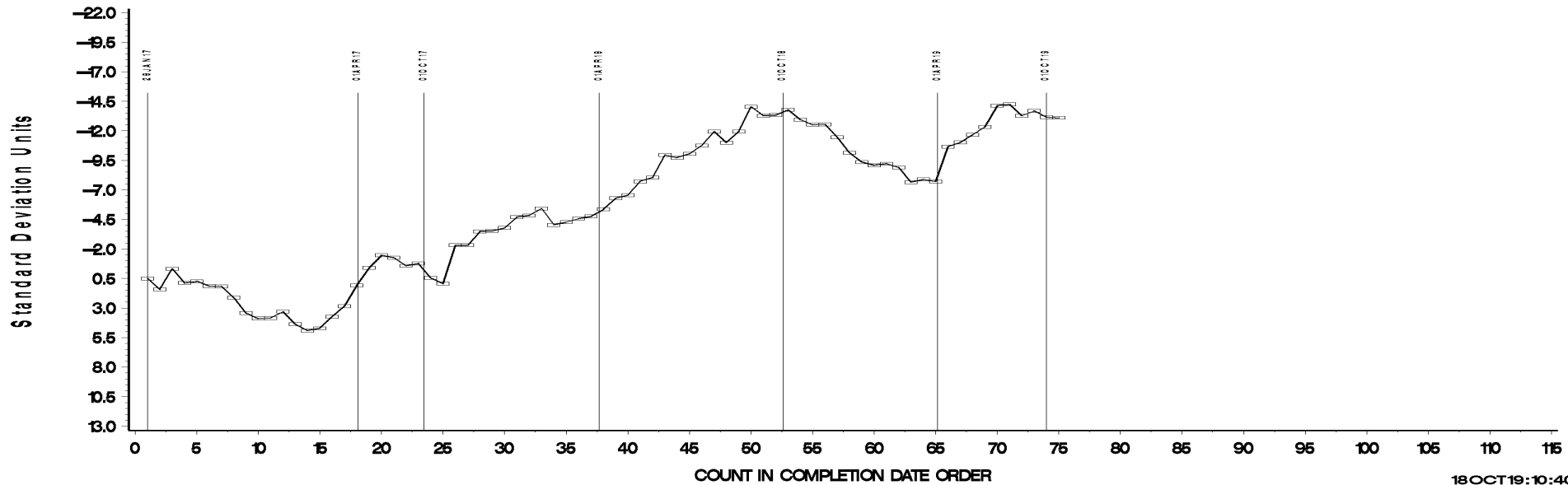


AVG PISTON SKIRT 50% RATING

LTMS Severity Analysis



CUSUM Severity Analysis



AESyi vs. APPARATS

