Sequence V Surveillance Panel Meeting
November 30th, 2020 10 AM EST

Roll Call:

Afton:	T. Dvorak, B. Maddock, C. Porter
BP:	J. Agudelo
Ford:	M. Deegan, R. Romano
Haltermann:	P. Tumati
HCS Group:	T. King
Infineum:	D. Boese, C. Laufer, C. Leverett, A. Ritchie (Chair)
Intertek:	A. Lopez
Lubrizol:	J. Brys
OHT:	J. Bowden
Oronite:	R. Stockwell
Shell:	J. Hsu
SwRI:	A. Chaudhry, T. Kostan, P. Lang, D. Engstrom
TEI:	D. Lanctot
TMC:	R. Grundza
Valvoline:	A. Savant
Willis Advanced Consulting:	A. Willis

Meeting Summary:

The panel met to assess current fuel inventory and prepare for the process of introducing a new batch of fuel for the VH test. The matter was recognized to be of higher urgency, especially if Gen 3 leads to a higher demand of VH testing. The panel will resume next week to provide a clear list of data requirements to fuel suppliers. VH charts are indicating a mild trend that warrants further investigation (operational, hardware, fuel, etc). Five 931 data points have been collected to date and briefly discussed; the panel will wait for the 6th data point for targets calculations and introduction.

Actions:

1. **Panel** to provide clear list of required data for alternate fuel supply to be considered.
2. **Labs / TEI** to provide a snapshot of the hardware parts we have and time remaining
3. **Chair** to contact the labs, TMC, and Ford to convene and investigate the mild trend further.
4. Open action from June 24th meeting: **Haltermann** to look at fuel data from Sec 8.2.6 requirement and report back to panel.

Next meeting: December 7th, 2020 @ 10 AM EST

Meeting was adjourned at approximately 11:32 AM EST

Meeting Details:

The Chair opened with a fuels update:

- About 187,000 gallons of fuel left.
- The fuel consumption rate has gone up since August, relative to 1H.

Prasad Tumati (Haltermann) confirmed that when the fuel was introduced in 2018, we started with 674,000 gallons. Based on the current consumption rate, the remaining inventory of 187,000 gallons may be enough to cover 2021. However, Al Lopez (Intertek) commented that with the Gen 3 specification, the consumption rate of about 20,000 gal / month may increase. If we continue at max consumption, we will run out of fuel by approximately August. It takes about 6 months to get a batch approved. And with participation of another vendor, this will take longer. Therefore, the level of urgency to address this is very high. Each lab confirmed they are running at full capacity or are preparing to run at full capacity.

It was explained by the Chair that Haltermann is the incumbent fuel supplier and the panel has a requirement to have a secure supply of fuel. All fuel suppliers would need to provide data to be considered as the next supplier. Tracey King (HCS) inquired what the quantity of information and composition of the data are required for the panel to see. Pat Lang (SwRI) suggested an approach that other groups in similar situations have employed: if the panel agrees to consider another fuel supplier, then to form a task force group that can discuss details, hurdles to overcome, etc. The discussion should yield a clear roadmap for fuel suppliers to know what criteria would need to be met to be considered a fuel supplier for the test. Pat also remarked that the fuel used for the Seq VH test is very different and that the task force would need to address this. Travis Kostan (SwRI), who has also experienced similar situations in other groups, recommended that the first step is for the SP to decide if another fuel supplier is something we want to consider. Perhaps the answer is no since this test is sensitive to fuel. Forming a task force is one approach. Another approach is to add the fuel topic as an agenda item at these surveillance panel meetings. Travis commented that the latter may be preferred as it's done at the panel level.

Jeff Hsu (Shell) added the 100 hr Yamaha testing group should be alerted. The Chair agreed that they should be informed of the process.

Al Lopez (Intertek) recalled that there was an option for a different fuel supplier in Europe to make sludge in a 2L test. In that case, the fuel was not considered because the MSDS or a component in the fuel was not approved by Ford. He therefore advised that before any testing is conducted, that the fuel properties and MSDS be supplied to Ford to approve.

Ron Romano (Ford) reminded the panel that we agreed we could go to an alternate supplier but at the time of the new fuel batch introduction, Haltermann was the only one who participated. The upcoming matrix would not be any different for the last fuel. Rich Grundza (TMC) added that regardless of how we do this, we'll still have to go through the fuel approval process that will entail the contracting process. Both Ron and the Chair recollected that the contract team would have to review the submission and make a decision on who the selected fuel supplier was for the next batch of VH fuel. Technical assessments would be made by the panel. Ron highlighted that the question becomes: does the panel look at the data before the contract is negotiated or do we have a number of suppliers go through the bidding process. And whoever wins the contract, starts running the tests. Ron explained that the reason for the contract is to get a better process. Rich Grundza (TMC) added that another reason can be to lock in the price. Levels of uncertainty for both parties (users of the test and the fuel suppliers) are high.

Jeff Hsu (Shell) stated that this would not be a simple fuel swap; Unlike it is for the Seq VI, fuel is a very important part of the Seq V. Ron Romano (Ford) added that Ford would not accept more than 1 fuel to be available for this test.

The panel will resume next week to consider what scoping data is needed. Tracey King (HCS) expressed appreciation for the panel's interest in HCS.

Re: TMC 931 results, the Chair reported that the 6th result will come in about a month at which point, the panel will reconvene to discuss targets and introducing it. As it is designed to be a borderline oil, it may show more variability. However, there does seem to be a mild trend and 931 could be a victim of this trend. Amol Savant (Valvoline) asked if there was any data on 931 before. The Chair reported that there was not any data but that the supplier presented Ford with a predicted result. Rich Grundza (TMC) presented the five 931 results collected so far and VH charts (VH summary.pdf). He commented that the variability of 931 isn't too far from that of 1009. Todd Dvorak (Afton) asked if fuel age could be a factor. Rich was not sure of the level of contribution from fuel age. A comment was made that we are started to see an appended fuel batch with data point 64 (ie: to account for the RVP adjustment).

The Chair asked if there's anything on the fuel batch to indicate fuel property changes or deterioration. Prasad Tumati (Haltermann) confirmed that this month's report did not indicate any fuel deterioration. The Chair commented however that this fuel is older than any fuel we've ever had. Rich Grundza (TMC) said there may be some differences with stand that warrants a closer look, but at the moment, there's no clear root cause for the mild trend.

The Chair summarized that the charts tell a story. Going forward, severity adjustments will hopefully address this by making the appropriate corrections. But he noted that there have been more alarms in the past few months than ever before. Ron Romano (Ford) suggested that we could try to investigate the mild trend a bit more. Looking at the operational data, hardware, the labs, fuel, anything else could be potential avenues to understand the mild trend. It was agreed to have a small operational group form to address this; the Chair will contact the labs, TMC, and Ford to convene and investigate the mild trend further.

Note shortly following the meeting was sent by Mike Deegan (Ford) requesting for a summary snapshot of VH hardware inventory to discuss possible issues related to parts shortages. This will be added to the December 7th SP agenda.

VH summary.pdf

Copied below:

VH 931 Results and Industry Alarm Status

All Reference data reported through 11/30/20

Summary of Review

- Five tests completed on oil 931 (Summarized on next page)
- RAC is in action alarm (mild direction)
- All other parameters in control. AES had been in alarm, but cleared with the most recent test. Current charts do not reflect 931 results. Industry charts with those 931 results are included later in this presentation.

Summary of Results and Targets (N = 5)

ltmslab	val	ind	ltmsdate	RAC	AP50	AE50	AES	RACti	RACti with SA	AES with SA	AEV with SA	APV with SA
G	PC	931	20200815	7.64	8.55	9.34	7.66	0.858662	1.01936	7.62	9.25	8.7
A	PC	931	20200918	9.4	9.12	8.67	9.15	-0.51083	-0.42713	8.9	8.68	9.22
D	PC	931	20200919	8.54	8.2	9.16	7.77	0.378436	0.49414	7.59	9.24	8.37
G	PC	931	20201021	9.08	8.2	8.64	8.37	-0.08338	0.13512	7.98	8.44	7.98
B	PC	931	20201115	8.72	7.7	9.07	7.99	0.24686	0.43216	7.46	9.19	8.1
				Mean	8.354	8.976	8.188	0.17795	0.33073	7.91	8.96	8.474
				s	0.52	0.31	0.60	0.512596	0.5301	0.59	0.38	0.50
				1009 Mean	7.89	8.81	7.21	0.0515				
				1009 s	0.74	0.4	0.44	0.3139				

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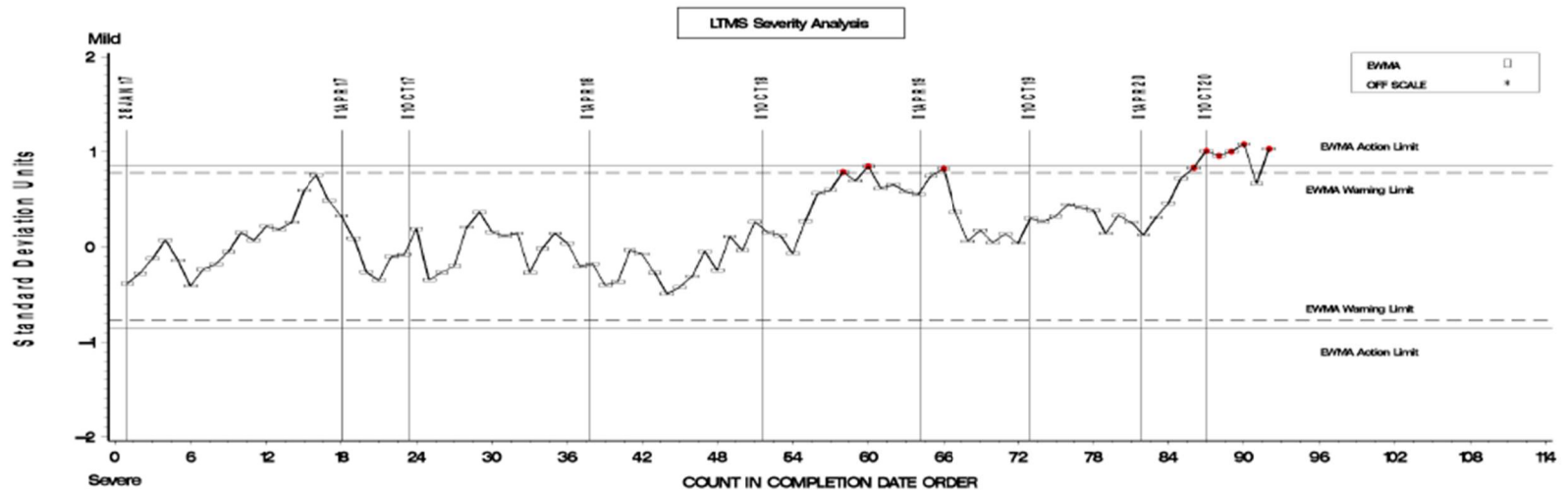
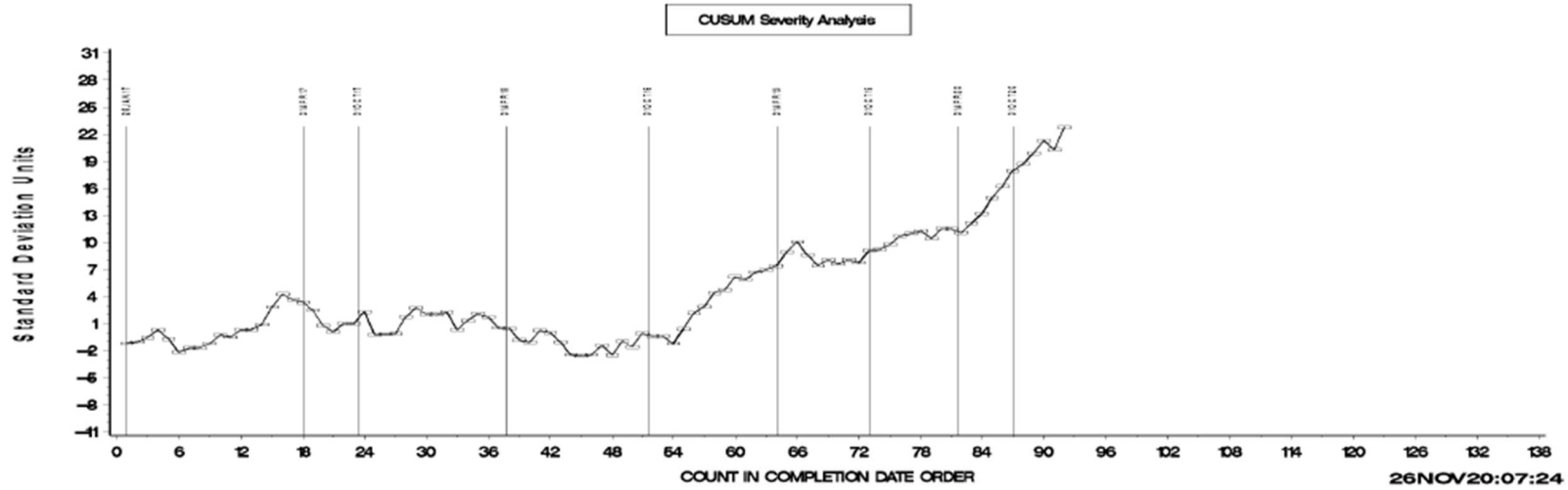
SEQUENCE VH INDUSTRY OPERATIONALLY VALID DATA

AVERAGE ENGINE SLUDGE





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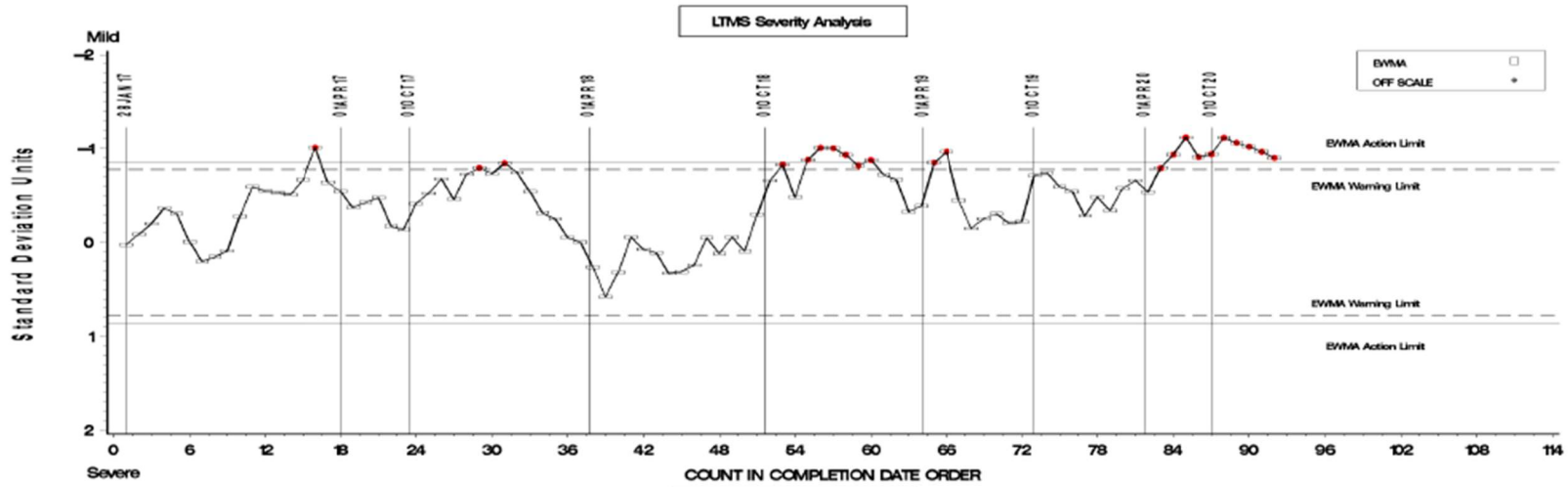
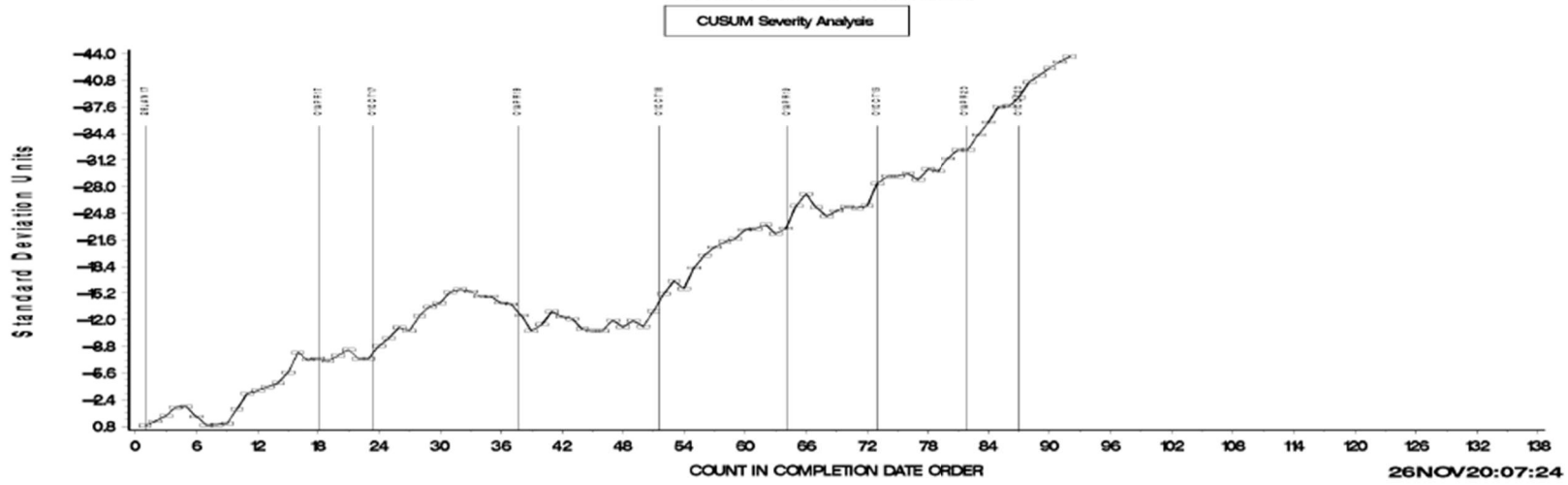
SEQUENCE VH INDUSTRY OPERATIONALLY VALID DATA

AVERAGE ROCKER COVER SLUDGE





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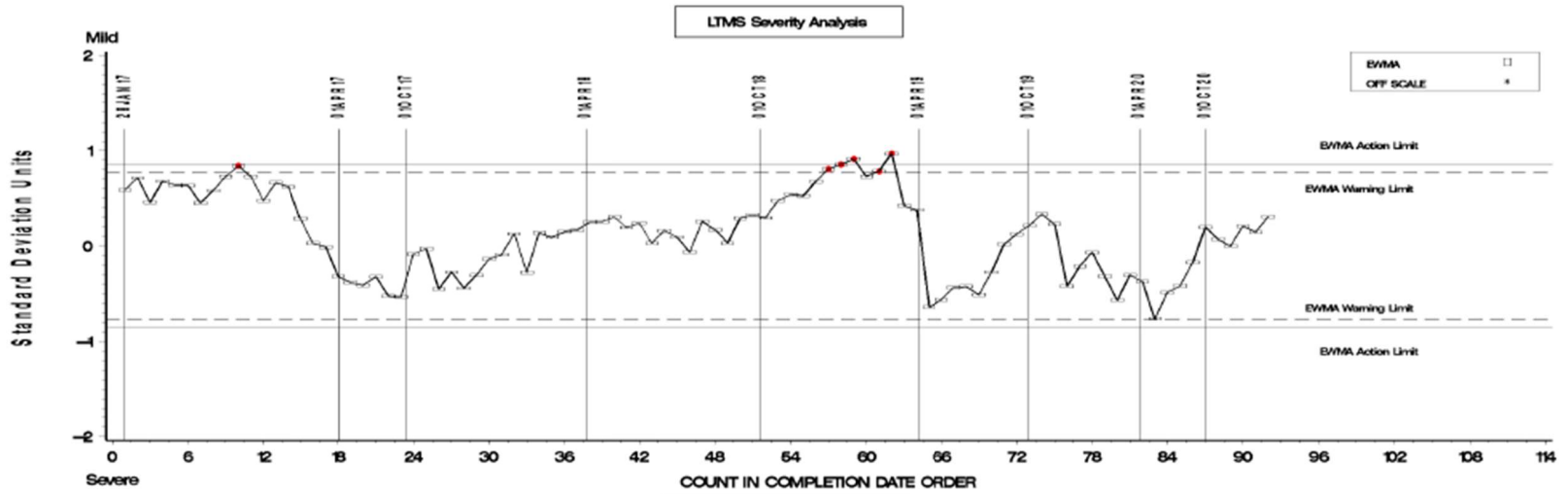
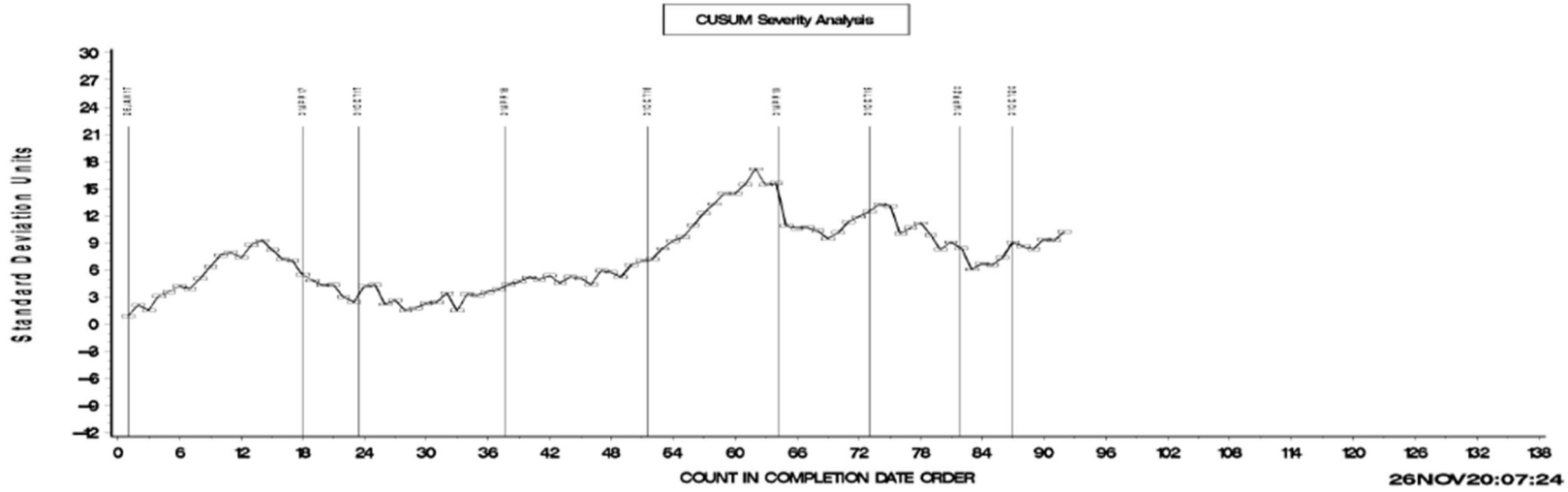
AVG. ENG. VARN. 50% RATING





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SEQUENCE VH INDUSTRY OPERATIONALLY VALID DATA

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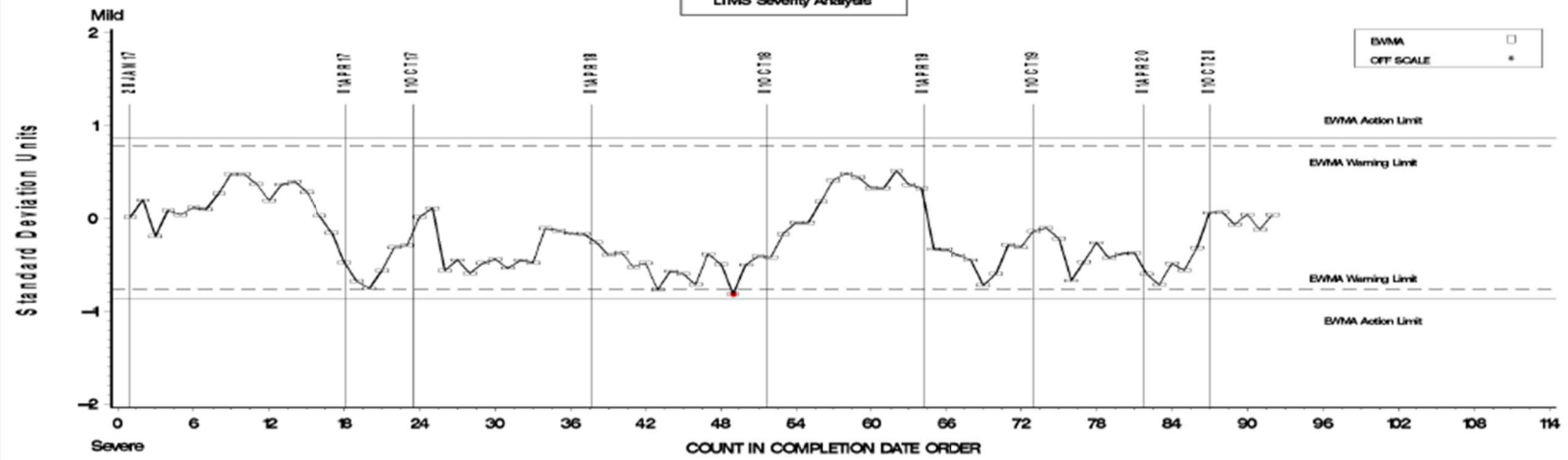
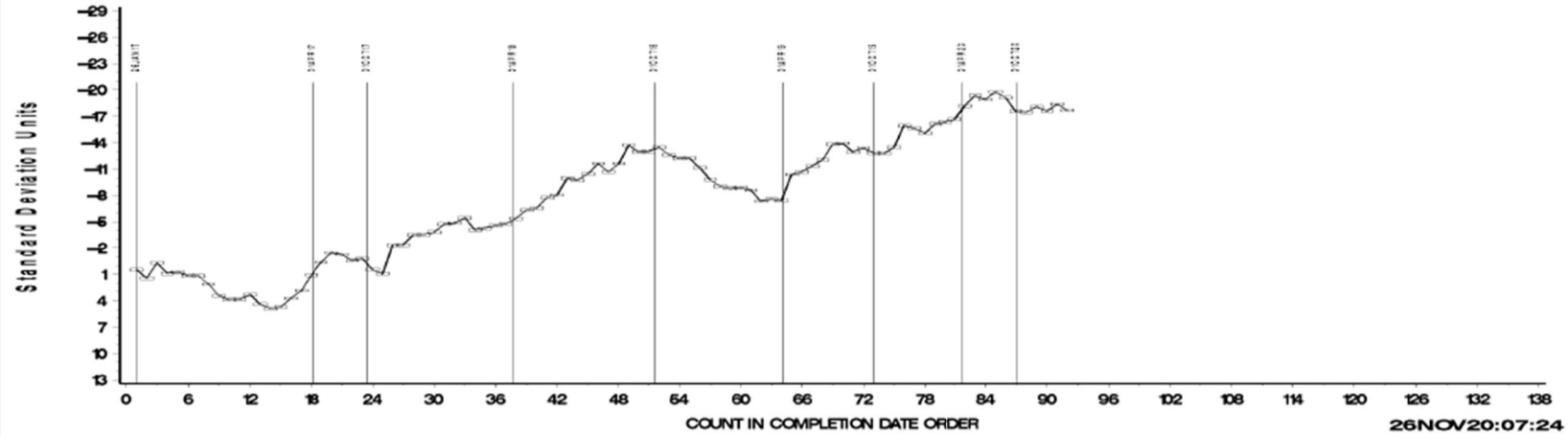
AVG PISTON SKIRT 50% RATING

LTMS Severity Analysis



CUSUM Severity Analysis



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