Sequence VIE/F Severity Review Task Force 8/10/2022

Scope:

The ASTM Sequence VI Surveillance Panel requested a Task Force be formed to review/explore the observed severity bias of the of the CUSUM chart for the Seq. VIE/F FEI2 parameter and potentially identify the factor(s) contributing to the FEI2 severity.

Objectives:

The Task Force will:

- Review available calibration data to determine a timeline of the severity bias.
- Review existing calibration data to identify individual factors that could influence the severity of the test:
    - Review conclusions/results from the FEI2 Severity TF formed in 2017.
    - Research individual labs severity.
    - Research individual engine/stand influence on the overall dataset.
        - If there is significant difference in labs performance, should group lab audits be completed with reps from each lab visiting all the labs?
    - Influence of calibration oils on labs severity.
        - Are all labs performing similar with the same RO?
        - Have there been a bias from one batch of RO to the next?
    - Potential bias due to fuel batch changes.
    - Potential bias due to hardware changes.

Below is the agenda for this meeting, if you have any additions, please send them to me and Cc this distribution.

- Roll Call and membership changes
- Approval of meeting minutes from 20220727.
- https://www.astmtmc.org/ftp/docs/gas/sequencevi/minutes/Sequence%20VIEF%20Severity%20Task%20Force20220727.pdf [astmtmc.org]
- **Review of action items**
    - Angela Willis: Create a template for the Brainstorm/RedX meeting. Completed.
    - Rich Grundza: Check the meeting minutes from the previous task force to find the final presentation of the findings. Completed.
    - Adrian Alfonso: send TF dist. List to Rich G. Completed.
- FEI Severity Brainstorm/Root Cause Analysis.
    - Doyle provided initial observations on the FEI1 data that might lead to the root cause of the bias. In summary, the issue could be the conventional approach is the stats group weights the labs equally for the purpose of the precision matrix, the equal weight factor stays in the LTMS system after the precision matrix and targets are in place. The concern is that some labs have higher activity than others throughout the life of the test,

therefore have a bigger influence on the average severity of the test. This issue has been observed in other test types. Doyle and Rich Grundza will complete a study in which they will change the weight factor to be more proportional to the influence of every lab based on the frequency/activity level and compare the contribution to the average severity to the contribution with equal weight factor. The expectation is this study will provide valuable information to better understand the CUSUM bias and the true status of the severity of the test. One concern is the FEI1 severity has been consistently trending since the beginning of the life of the test whereas FEI2 had a change in 2017 and after that it has been consistent. The average slope of both appears to be similar though.

- o Brainstorming using the Root Cause Tree Tool provided by Angela Willis. Brainstorming will be on hold until Weight Factor Analysis is completed.
- Action Items:
  - o Doyle and Rich Grundza will work on a weight factor distribution study and present to the group next call.
- Schedule for next conference call.
  - o Next call will be on 8/31/2022 10:00 am CT.

Attendance Sheet

REPRESENTATIVE	COMPANY	VOTING MEMBER (x)	ATTENDED (Y/N)
Ben Maddock	AFTON	x	Y
Rich Grundza	TMC	x	Y
Doyle Boese	INFINEUM	x	Y
Andrew Stevens	LUBRIZOL		Y
George Szappanos	LUBRIZOL	x	Y
Robert Stockwell	ORONITE	x	Y
Paul Rubas	EXXONMOBIL	x	Y
Michael Deegan	FORD	x	N
Angela Willis	Willis Advanced Consulting	x	Y
Adrian Alfonso	INTERTEK	x	Y
Bill Buscher	INTERTEK		N

Izabela Gabrel	HALTERMANN CARLESS	x	Y
Daniel Engstrom	SwRI	x	Y
Christine Eickstead	SwRI		Y