# Sequence V Surveillance Panel Meeting
## June 2nd, 2022  11 AM EST, via MS Teams

**Roll Call:**

| | |
|---|---|
| Afton: | B. Campbell, B. Maddock |
| BP: | J. Agudelo |
| ExxonMobil: | A. Montufar |
| Ford: | M. Deegan, R. Zdrodowski |
| General Motors: | M. Hopp, N. Siebert |
| Haltermann: | P. Tumati |
| HCS Group: | I. Gabrel |
| Infinum: | C. Laufer, A. Ritchie (Chair) |
| Intertek: | J. Franklin, A. Lopez |
| Lubrizol: | J. Gingerich, A. Stevens |
| OHT: | J. Bowden |
| Oronite: | R. Stockwell |
| Shell: | J. Hsu |
| SwRI: | T. Kostan, P. Lang |
| TEI: | D. Lanctot |
| TMC: | R. Grundza |
| TOTAL: | A. Willis |
| Valvoline: | A. Savant |

**Meeting Summary:**
- Haltermann updated the SP that the CofA of the new fuel batch would be delayed until June 13th due to a delay in one of the raw materials.

- Continuing the RAC target discussion, a motion was made to:
  **Update the RAC target for RO 940 to a mean of 0.8041 and a standard deviation of 0.234, effective Thursday, June 9th, 2022.  Recalculate severity adjustments, effective June 9th, 2022.**
  **On June 9th, TMC will recalculate each labs' tests SA using the new updated targets and that will become the labs' SA for RAC from that day forward.**
- Allowing for time to review, the group will reconvene on June 13th to vote on the motion. There was significant discussion on the impact of updated severity adjustments on candidate data but it was agreed that this item is separate to having accurate targets set in preparation for the fuel matrix.

**Open Actions:**
1. From March 26th, 2021 meeting: **Lab engineers** to meet to investigate severity shifts (share operational data, build data, ratings, etc.).  The TF has been productive and meeting frequently.
2. From Sept 9th, 2021meeting: **Statisticians Group** led by Doyle Boese (Infineum) to provide update around potential ways to improve current lab-based system.  Interim recommendation is to not adopt a stand-based system.
3. From Sept 9th, 2021 meeting: **Haltermann** to report monthly inventory via email to V SP.  Monthly updates are being provided.

4. From Nov 29th, 2021 meeting: **Haltermann** to include extra column in fuels data to indicate which fuel goes with which test.
5. From February 10th, 2022 meeting: **The VH Task Force** to assess number of parts remaining as it relates to the life of the test.
6. From February 10th, 2022 meeting: **Haltermann** to report average time it takes for them to respond back to the labs with RVP data.
7. From February 10th, 2022 meeting: The **VH Task Force** to discuss the lab responsibility to measure the fuel parameters as received (section 8.2) vs the use of the CoA.
8. From May 16th, 2022 meeting and June 2nd, 2022 meeting: **Bob Campbell** and **Andrew Stevens** to consider if their labs, Afton and Lubrizol respectively, would be willing to participate in helping Angela come up with a more realistic forecast number for the VH.
9. From May 16th, 2022 meeting: **TMC** to generate new RAC target using the 7 valid, chartable RO 940 data points plus the 14 additional RO 940 results run on the same DJ fuel batch.
10. From May 23rd, 2022 meeting: **Haltermann** to communicate the fuel status through the next few weeks.  Ex: Labs need to know delivery dates so they can make sure clean tanks are ready.
11. From May 23rd, 2022 meeting: **IAR, SwRI, and Afton labs** to let group know about stand options (as per Amol Savant's comments from prior meeting, see page 4 of May 16th minutes)
12. From May 23rd, 2022 meeting: **Haltermann** to coordinate with the labs to collect RVP data of the new fuel.
13. From June 2nd, 2022 meeting: **Fuel contract team** to discuss the fuel matrix changes and send back to the panel for review by June 13th, the expected date the CoA for the new fuel batch would be ready.
14. From June 2nd, 2022 meeting: **Travis Kostan (SwRI) and Rich Grundza (TMC), and any other volunteers** to take a more careful look and confirm with the labs that the conclusions we quickly reached during the meeting re: the directional change to candidate data from updated severity adjustments remain the conclusions.

Next call:  Monday, June 13th, 2022 at 1 PM EST via Webex

**Meeting Details:**

Meeting Agenda:
- New fuel planning including resolving structure of VH test matrix.
- Option to reset 940 RAC targets.

The meeting started with a quick review of what inventory information Angela Willis (TOTAL) needs from the dependent labs to reestablish the baseline for the forecast model.  The Chair asked the lab representatives from Afton and Lubrizol if they would be participating.  Bob Campbell (Afton) and Andrew Stevens (Lubrizol) will get back to Angela with a decision in the next few weeks.  Later in the call, Al Lopez (Intertek) shared that his lab has 114 engine blocks with pistons and rings, which equate to 456 tests.  Based on IAR run rates from the past 3 years, he estimates that Intertek will be out of hardware by 2026.

Prasad Tumati (Haltermann) updated the group that the CoA is expected on June 13th.  The 2-week delay was due to a raw material not being delivered until this week.  If the labs are satisfied with the CofA, the fuel shipments would be scheduled the week of June 13th.  Intertek

and SwRI confirmed they would be ready to test upon receipt of the fuel and Afton will hold until the initial 940 runs are completed in San Antonio (approximately first half of July).  The fuel contract team will need to reconvene to discuss the fuel matrix changes and send back to the panel for review.

Following up on the RAC target item, Rich Grundza (TMC) made a motion to:
> **Update the RAC target for RO 940 to a mean of 0.8041 and a standard deviation of 0.234, effective Thursday, June 9th, 2022.  Recalculate severity adjustments, effective June 9th, 2022.**
> **On June 9th, TMC will recalculate each labs' tests SA using the new updated targets and that will become the labs' SA for RAC from that day forward.**

As learned from the previous SP call, the Chair reminded the group that this would be an LTMS item, not an Information Letter.

The motion was seconded by Al Lopez (Intertek), who later withdrew the second due to panel's subsequent discussion on severity adjustments and their impact to candidate data.
- Travis Kostan (SwRI) confirmed that the severity adjustments would be updated for tests moving forward but would not be applied to candidate tests that have already been run.
- For clarification, Mike Deegan (Ford) asked to review the RAC EWMA chart shared at the previous meeting:
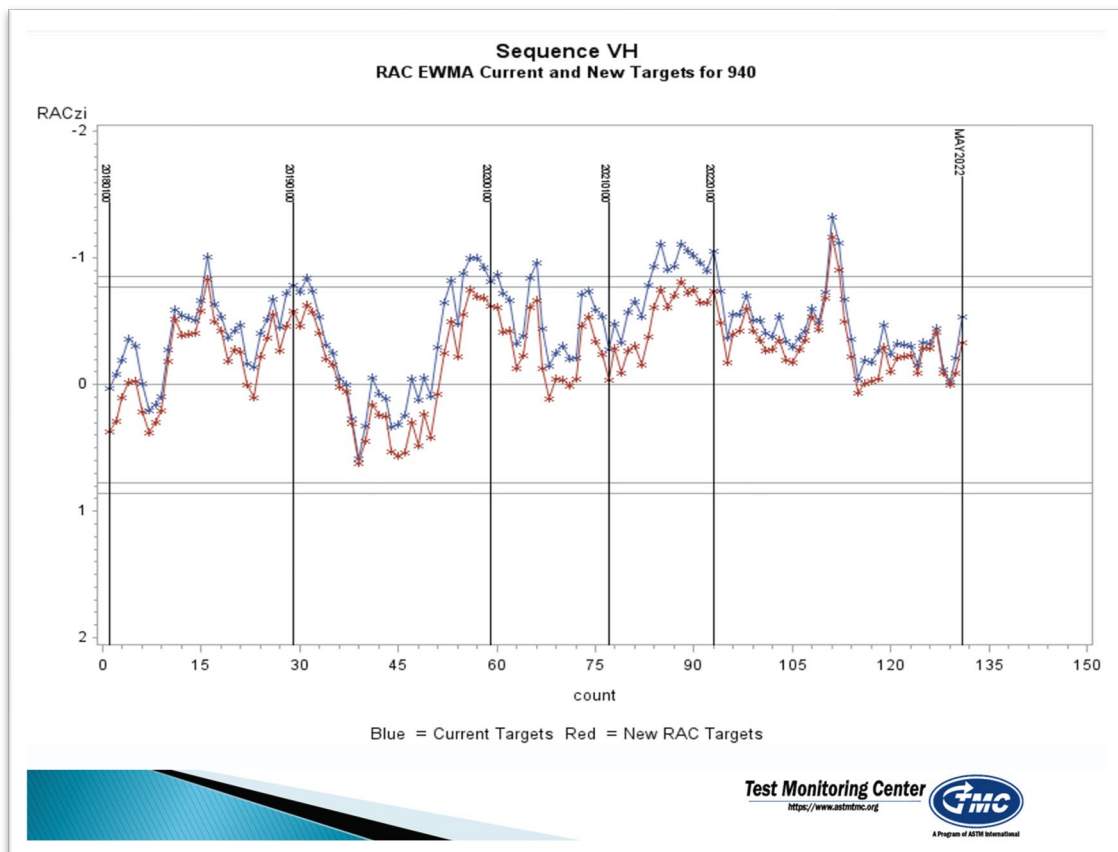


The blue data is the original and the red data is with the shifted target.  Alarms significantly reduce from 28 down to 6.  Mike asked if these are all transformed (for RAC), to which Rich affirmed.

- Nathan Siebert (General Motors) asked why we wouldn't retroactively apply the SA to candidates. This could better protect the OEMs if candidates would fail under the updated SA. Rich Grundza (TMC) explained that this typically hasn't been done because it could have potential for disruption to the marketplace. The SA that would have been applied using the new targets would make the test harder to pass for candidates. Jeff Hsu (Shell) added that back applying the SA to candidates would reduce the pass rate. Nathan commented that a reduced pass rate is what OEMs would like so that there are better products in the market. Jeff clarified that it's more about an accurate pass and more robust test. It's an industry test and a robust test is desired. Travis Kostan (SwRI) provided an example: if you run a reference and get an 8 but the target is a 7, then SA would lead to a subtraction from the candidate result. But if you say the target should have been a 7.5 instead of 7, then the SA would be less and subtraction is less. So he believed that we would actually end up passing more tests than failing them. Although we haven't done retroactivity on candidate data, the Chair acknowledged that the question from Nathan is a reasonable one to ask and that we need to answer his question with data.
- Bob Campbell (Afton) pointed out that these kinds of issues have occurred the past 30 years and we've never gone back to correct candidate data. The job of this panel is to keep an eye on this test and if we see mistakes, we try to correct them asap. With that said, the impact of recalculating the SAs would be expected to be very small. Nathan Siebert (General Motors) countered that there are millions of customers relying on our vehicles and OEMs need to ensure they have the best product and protection possible.
- Al Lopez (Intertek) highlighted there are 2 separate issues: 1) we need to set the 940 RAC targets accurately so we can enter the fuel matrix with a known value for the oil, and update the severity adjustments going forward, and 2) understand what exactly happens to candidate data when we apply the new RAC target. Addressing the 2nd item is not the responsibility of this panel.
- Amol Savant (Valvoline) calculated that the results would improve for his data set in the retroactive space.
- The Chair reiterated the question from Nathan is sensible and we will need time to answer his question. Bob Campbell (Afton) agreed with Al that ultimately this topic is above this SP group. Robert Stockwell (Oronite) observed this is a good reminder how important each of these decisions are and how much attention to detail we need to take. The Chair asked Rich Grundza (TMC) to work with the labs to understand global impact on the results to address Nathan's question. Rich noted that each lab will have to redo their severity adjustments after each 940 result.
- Amol Savant (Valvoline) commented this is an ASTM test and this group monitors the test with respect to the methodology, validity, precision, and accuracy. He would not be able to vote on anything business related from the retroactivity issue.
- Rich Grundza (TMC) suggested to move forward with the motion and then the labs look at the effect on their candidate data and handle that separately. Bob Campbell (Afton) noted it's an interesting exercise but was unsure what to do with the information because the subject of addressing the candidate data should not come back to this panel.
- The Chair asked Nathan Siebert (GM) for guidance on next steps. Nathan asked to see actual data on what the severity adjustments are and what they would do to the results. Rich Grundza (TMC) addressed this request real time by sharing a table of the labs' SA (labs have been recoded A through E (not with actual data or labs):

| | A | B | C | D | E |
|---|---|---|---|---|---|
| | Lab | Current | Updated | At 8.0 | |
| | A | -0.0179 | -0.078 | 8.035481 | 8.150071 |
| | B | 0.0919 | 0.0296 | 7.80749 | 7.939915 |
| | C | 0.1585 | 0.1161 | 7.656496 | 7.753784 |
| | D | 0.0083 | 0.0247 | 7.983331 | 7.949985 |
| | E | 0.0988 | 0.0945 | 7.792309 | 7.801782 |

Where column B represents the current SA in transformed units, column C represents the updated SA in transformed units, column D represents what a result of 8.0 merits would turn into after the current SA is applied, and column E presents what a result of 8.0 merits would turn into after the updated SA is applied.

Travis Kostan (SwRI) summarized that the change would result in an increase in about a tenth of a merit for 3 labs and essentially no change for 2 labs. The Chair recapped that then borderline failing results might recalculate to borderline passing results but the reverse would not occur. Bob Campbell (Afton) commented that a tenth of a merit in RAC sludge is in the noise.

- Al Lopez (Intertek) remarked that if RAC is borderline, the AES is very bad .i.e. RAC is much higher than AES. Both Jeff Hsu (Shell) and the Chair agreed to this statement and commented how the VH is different from VG in that the sludge drops to the oil pan.
- Since the meeting time was coming to a close, the Chair asked Travis Kostan (SwRI) and Rich Grundza (TMC), and any other volunteers to take a more careful look and confirm with the labs that the conclusions we quickly reached during the meeting re: the directional change to candidate data from updated severity adjustments remain the conclusions. When we reconvene at the next meeting, the group can try to make a unanimous decision. Both Mike Deegan (Ford) and Nathan Seibert (General Motors) are ok with this approach and appreciated the extra week to digest the discussion.
- Many in the SP group stressed the need to decouple the target update issue and the retroactivity issue. We need to update the targets / vote on the motion in order to move forward but a week's time was requested to review. The group will vote on the motion at the next meeting.
- In the interim, Mike Deegan (Ford) asked Rich Grundza (TMC) and the Chair to have a separate smaller meeting, including Nathan Seibert (General Motors), to better understand the issues.

Meeting adjourned at 12:48 PM EST.

# RAC Target Update

May 23, 2022

# RAC Target Calculation

▸ Used all results on 940 from DJ0121NX10 fuel batch for a total of 21tests.

▸ Targets would be $\overline{X}$ of 0.8041 and s = 0.234, in merit units the mean would be 7.77 compared to the current mean of 7.50

▸ For comparison purposes, the following charts show the current means and s in transformed units, separate industry charts with existing targets and new targets and an overlay the same EWMA charts
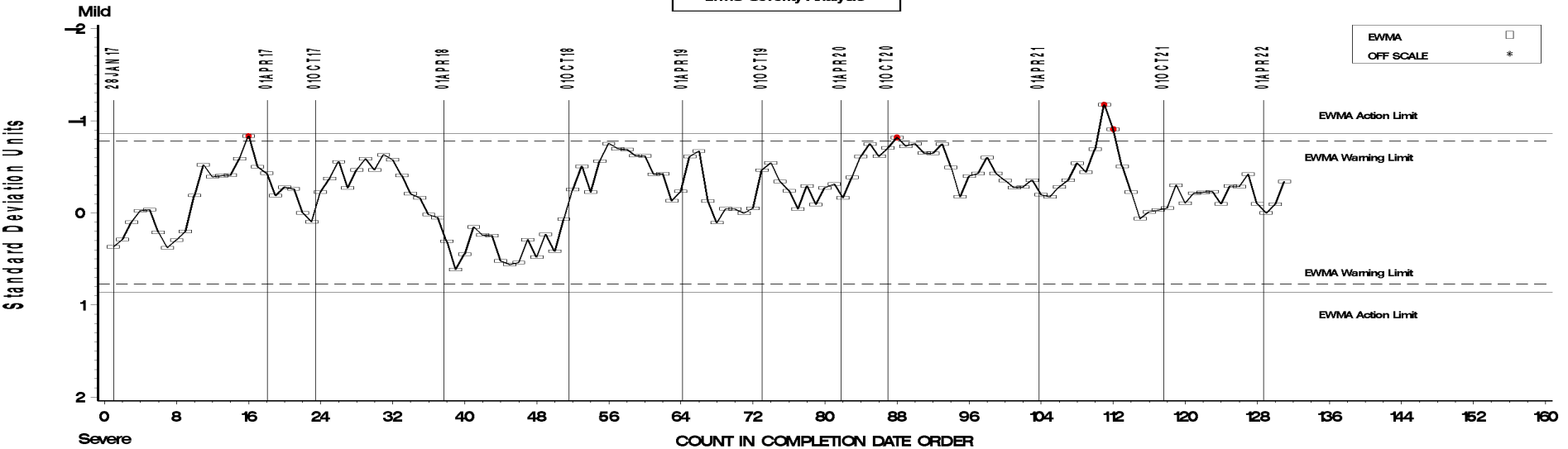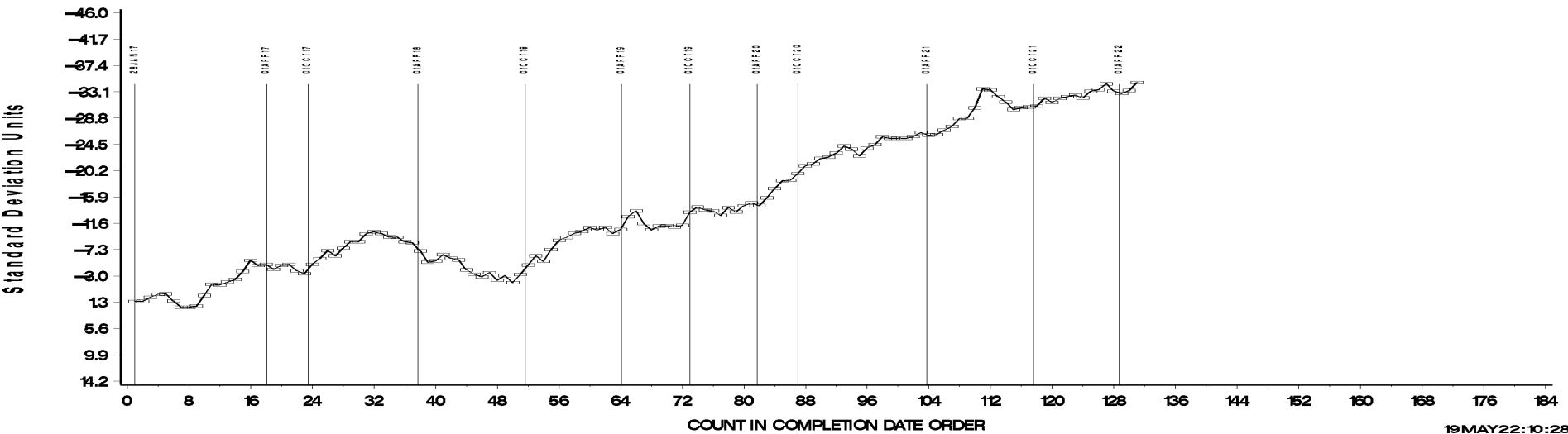
# RAC Targets
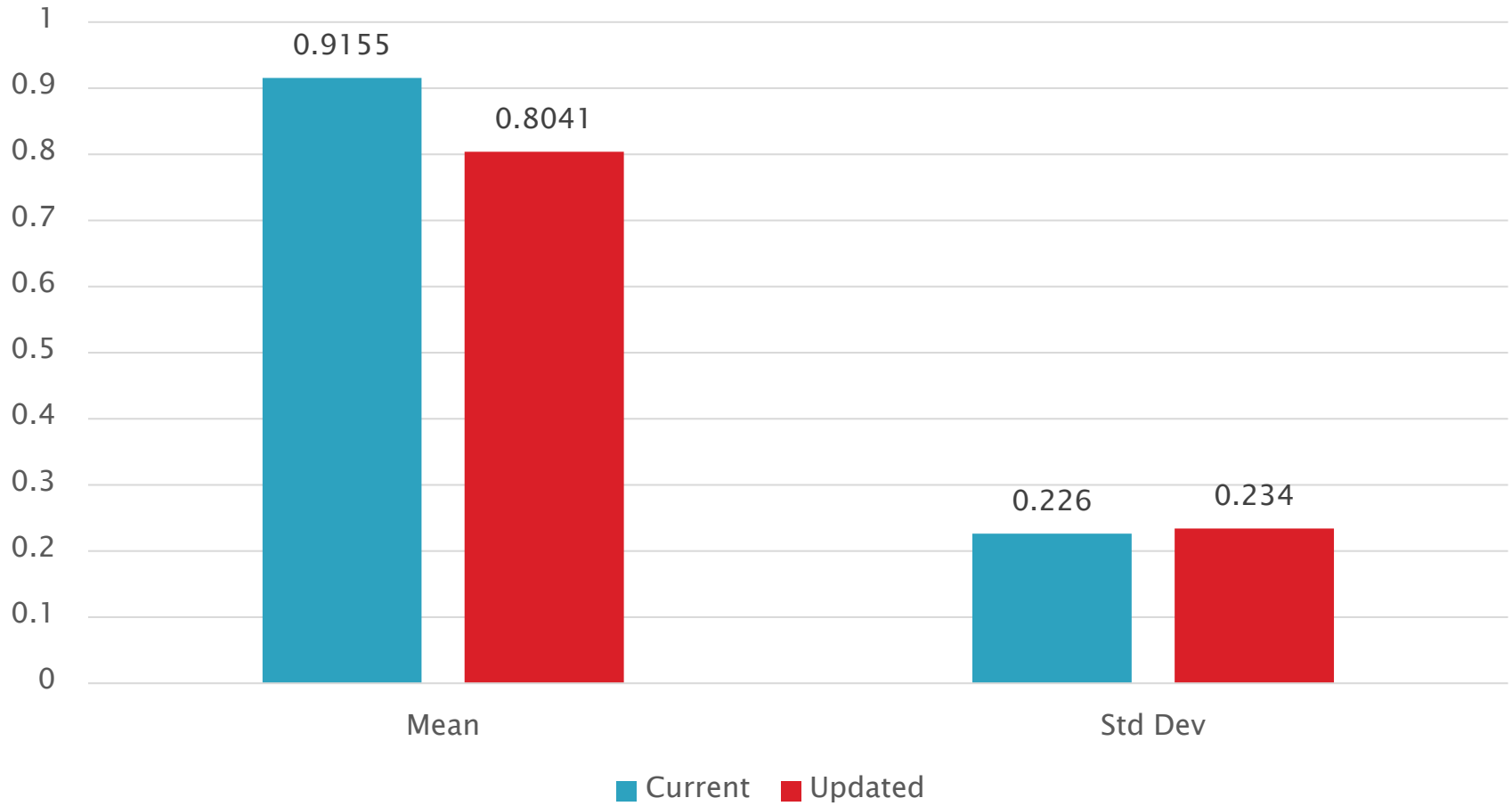
# SEQUENCE VH INDUSTRY OPERATIONALLY VALID DATA
## EWMA and CUSUM With New Targets
## AVERAGE ROCKER COVER SLUDGE



LTMS Severity Analysis

CUSUM Severity Analysis

Test Monitoring Center
https://www.astmtmc.org
A Program of ASTM International

19MAY22:10:28

# SEQUENCE VH INDUSTRY OPERATIONALLY VALID DATA
## Existing Targets
## AVERAGE ROCKER COVER SLUDGE

LTMS Severity Analysis

CUSUM Severity Analysis

19 MAY 22 : 10 : 45

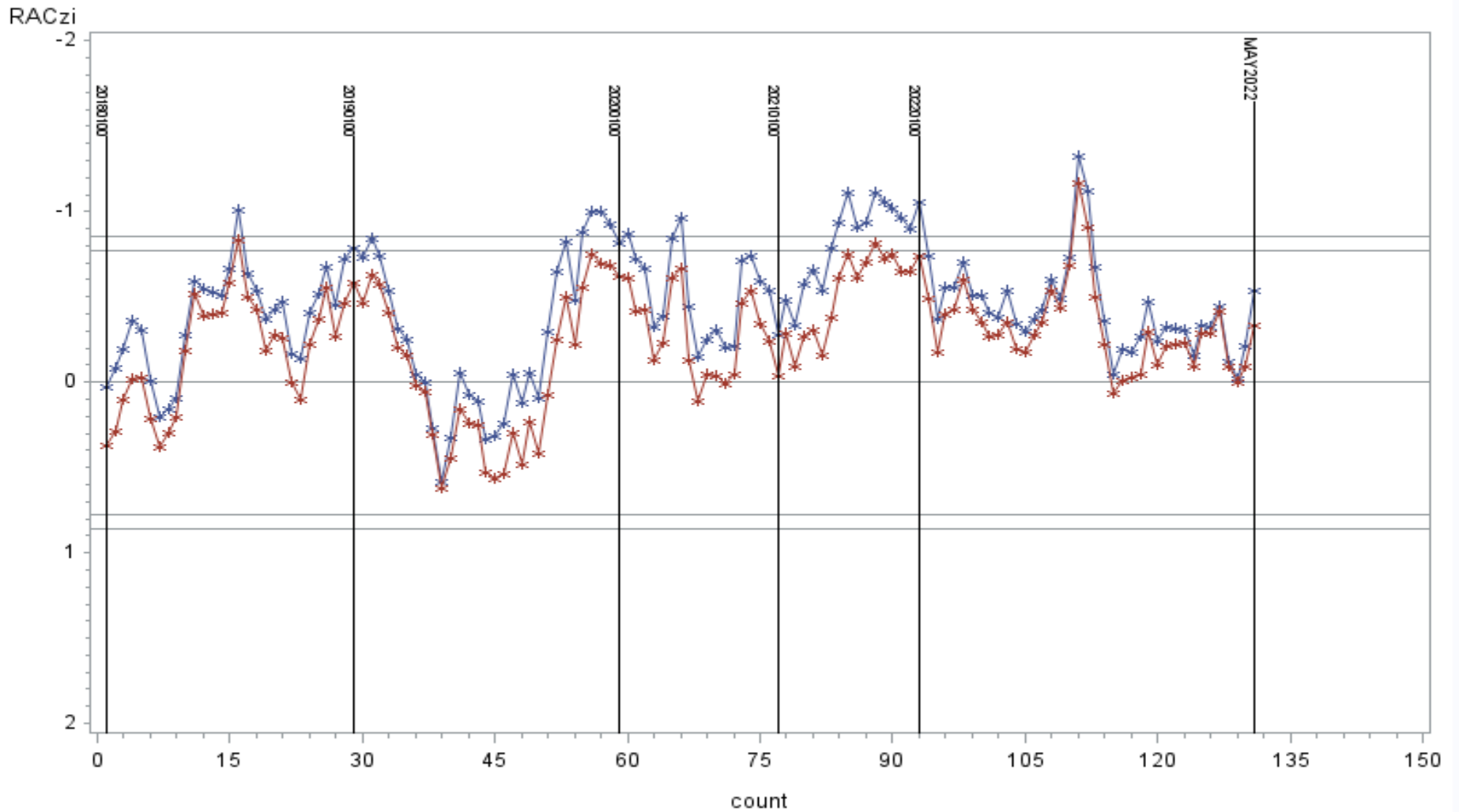Test Monitoring Center
https://www.astmtmc.org
A Program of ASTM International
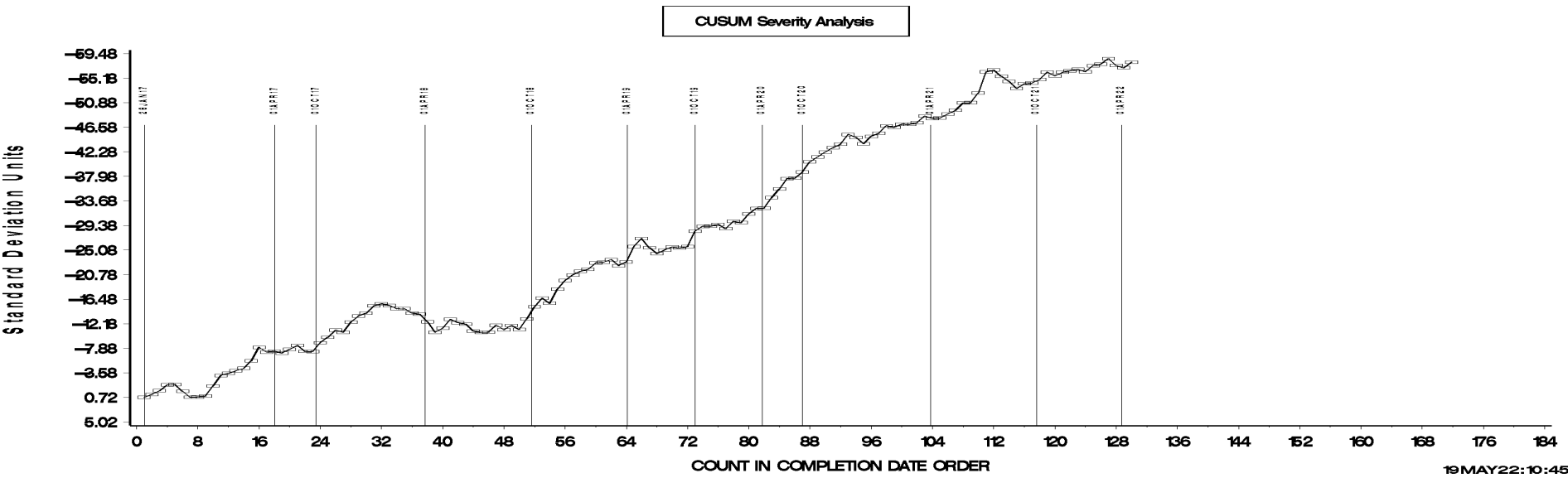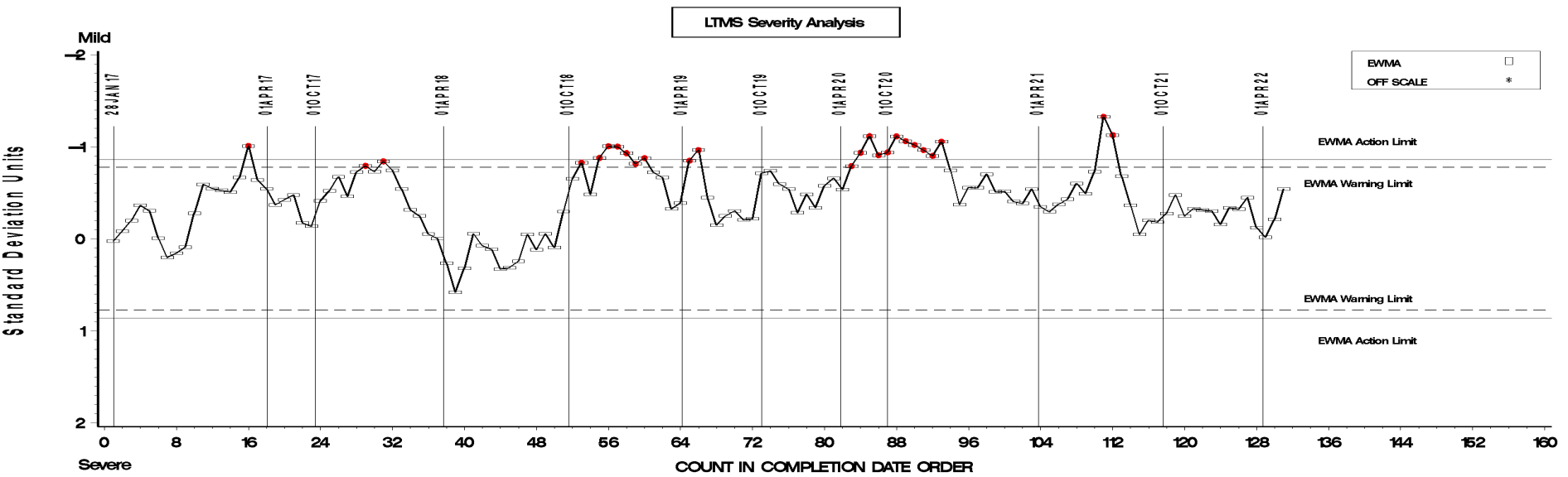
Sequence VH
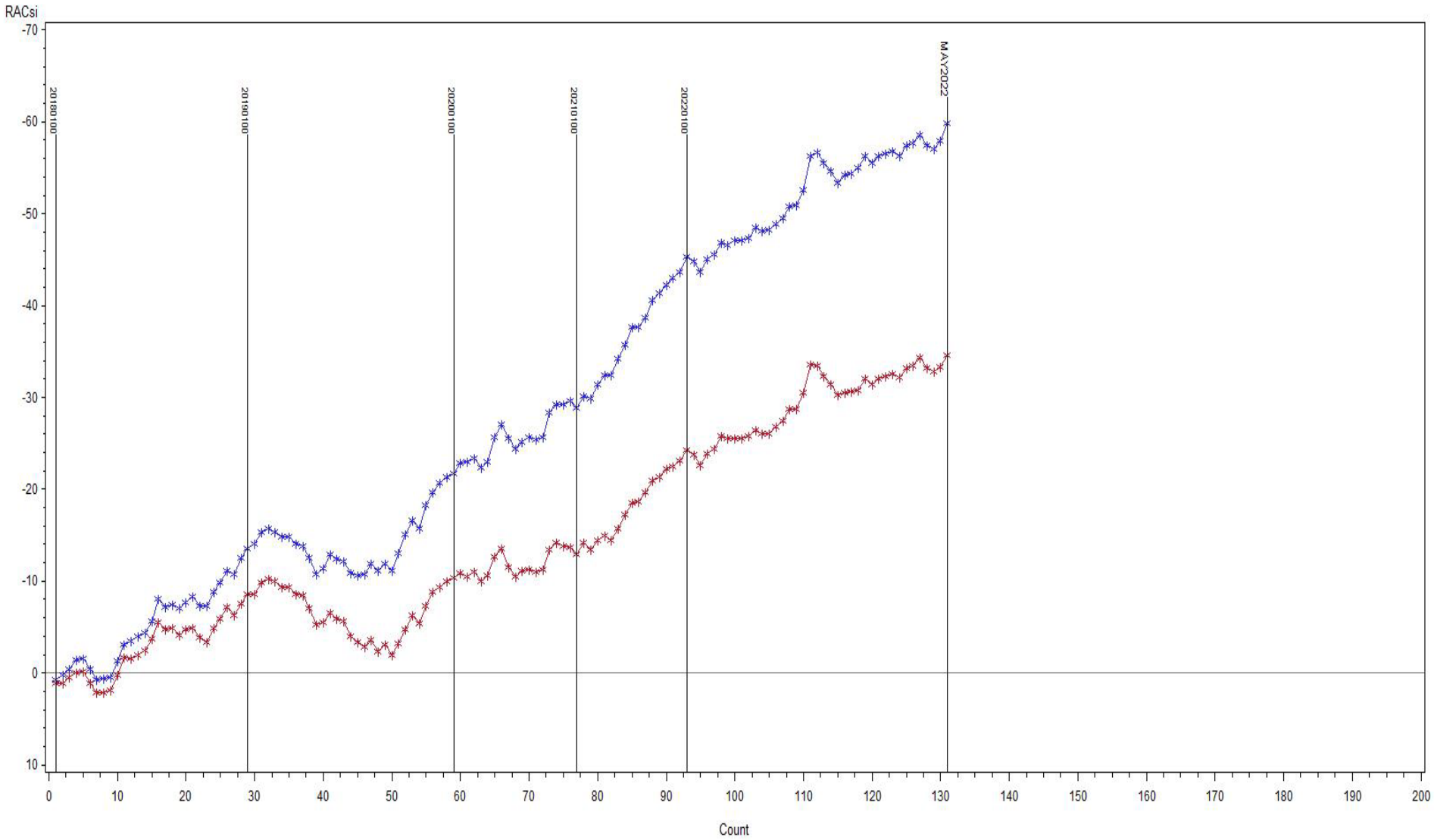RAC EWMA Current and New Targets for 940

Blue = Current Targets   Red = New RAC Targets

# Sequence VH
## RAC Summation delta/s Current and New Targets for 940



Blue = Current Targets   Red = New RAC Targets

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