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COMMITTEE D02 ON PETROLEUM PRODUCTS, LIQUID FUELS, AND LUBRICANTS

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Originally Issued: May 5, 2020

Reply to: Richard Grundza
ASTM Test Monitoring Center
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Pittsburgh, PA 15206
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Unapproved Minutes of the May 4, 2020
Sequence IV Surveillance Panel Conference Call.

The meeting was called to order by Chairman Buscher at 12:00 PM Central Time.

A copy of the agenda is included as attachment 1.

A list of attendees is included as attachment 2.

Membership changes include removing of Jim Linden and adding Paul Rubas, Ph.D as voting member for ExxonMobil.

The panel discussed the draft IVB Method and reviewed the status of open items (see attachments 3 and 4) and addressed a few wording clarifications. After these discussions, the panel unanimously approved the draft method for ballot. The copy for ballot has been posted on the TMC website and can be accessed via the following link:
http://www.astmtmc.cmu.edu/ftp/docs/gas/sequenceiv/procedure_and_ils/ivb/Sequence%20IVB%20Draft%20Procedure%20for%20ballot%2020200504.pdf

The panel reviewed and discussed severity differences between labs and discussed recent industry warning and action alarms for AVLI. During a previous meeting, a request was made of the TMC to review current industry data to determine if the differences in lab severity noted during the precision matrix are still evident. The TMC had conducted that review and found those differences are still evident for both AVLI and Fe. During review of the industry control charts, it was noted that four stands, all recently trending severe may have been responsible for the recent alarm in AVLI. It should be noted that the alarm has cleared. A request was made of the TMC to continue to keep the panel informed of any changes in severity in the upcoming weeks. The TMC presentation regarding severity is included as attachment 5.

The panel discussed a request by the ACC Monitoring Agency to review the way that lobe failures are documented and reported on Forms 1 and 14 of the test report. The ACC had noted that there are inconsistencies in how the ACC conformance page (Form 14) is being completed. The panel heard various opinions on how sections 2 and 3 of form 14 should be completed and after some discussion, the panel members agreed on how these should be documented. The guidelines are included as attachment 6. Subsequent IVB non reference oil tests will be documented in accordance with those guidelines. As part of this discussion, it was noted that the procedure dictates that tests encountering lobe failure during the tests are to be declared non-interpretable, but there is no such declaration when lobe failure is noted at the end of tests. The panel agreed to add a statement to section 12 of the draft method to identify all tests which exhibit lobe failure to be declared non-interpretable. The panel also briefly discussed a discrepancy in the number of tests identified as having lobe failure by the labs and those that are found to have lobe failure by the ACC. A request was made to have the TMC contact the ACC and determine how ACC is identifying the occurrence of lobe failure from the ACC database.

The meeting was adjourned at 2:30 PM CST.

Due to the number of items not addressed on the agenda, the next meeting will be at the call of the chair, with in the next two – three weeks.

Attachment 7 includes the motion and action items recorded during this meeting.

Attachment 1

Sequence IV Surveillance Panel

Conference Call
May 4, 2020
12:00 p.m. – 2:00 p.m.

A G E N D A

1. Chairman comments.
2. Attendance.
3. Membership changes.
4. ASTM balloting of Sequence IVB test procedure.
5. Sequence IVB industry severity trends.
6. Inconsistencies in reporting Sequence IVB candidate tests with lobe failures.
7. Sequence IVB inconsistencies in numbering practices between labs (aging and break-in).
8. Sequence IVB inconsistencies in number of operational data points.
9. Minor modifications to Sequence IVB Golden Stand.
10. Old business.
11. New business.
12. Motion and action item review.
13. Next meeting.
14. Adjourn.

MOTION 1+2 VOTES ↓ ✓ = APROVE

Attachment 2

MEMBERSHIP
SEQUENCE IV SURVEILLANCE PANEL

May 4, 2020

NAME	COMPANY-ADDRESS-PHONE-FAX-EMAIL	SIGNATURE
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MEMBERSHIP
SEQUENCE IV SURVEILLANCE PANEL

May 4, 2020

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MEMBERSHIP
SEQUENCE IV SURVEILLANCE PANEL

May 4, 2020

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SEQUENCE IV SURVEILLANCE PANEL

May 4, 2020

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SEQUENCE IV SURVEILLANCE PANEL

May 4, 2020

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May 4, 2020

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May 4, 2020

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May 4, 2020

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	Phone No.: Fax No.: Email:	
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	Phone No.: Fax No.: Email:	
	Phone No.: Fax No.: Email:	
	Phone No.: Fax No.: Email:	
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Attachment 3

Sequence IVB Items for Surveillance Panel Discussion

Discussed during 4/21/2020 Sequence IVB Procedure Review Sub-group WEBEX

- Inconsistencies in reporting candidate tests with lobe failures.
  - **Rich Grundza to get clarification on how to respond to No. 2 Part 2 (see below) of the Sequence IVB American Chemistry Council Code of Practice Test Laboratory Conformance Statement.**

No. 2 The laboratory ran this test for the full duration following all procedural requirements; and all operational validity requirements of the latest version of the applicable test procedure (ASTM or other), including all updates issued by the organization responsible for the test, were met.
Yes _____ No_____*
If the response to this Declaration is "No", does the test engineer consider the deviations from operational validity requirements that occurred to be beyond the control of the laboratory?
Yes _____* No_____

- Inconsistencies in numbering practices between labs:
  - **Recommendation is to address with an information letter.**
  - Test numbering.
    - **Only increment the number of tests since the last calibration test on the stand and the total number of tests conducted on the stand, for reference oil and candidate oil tests.**
  - Aging numbering (original 95 min break-in + 50 hr aging).
    - **Use a separate numbering scheme and increment separate from the test numbering scheme.**
    - **Do not increment the number of tests since the last calibration test on the stand and the total number of tests conducted on the stand, included in the test numbering scheme, when conducting an engine aging sequence.**
  - Break-in numbering (50 hr extended break-in).
    - **Use a separate numbering scheme and increment separate from the test numbering scheme.**
    - **Do not increment the number of tests since the last calibration test on the stand and the total number of tests conducted on the stand, included in the test numbering scheme, when conducting an engine break-in sequence.**
- Inconsistencies in number of operational data points.
  - **Multiple labs experience small discrepancies in total number of operational data points on a periodic or regular basis.**
  - **Recommendation is to continue as is. If a test is missing more than 1% then it is invalid. If a test is missing less than 1%, but at least 1 of the 720,000 data points, then comments describing the anomaly must be included in the test report.**
- Modification to driveline guard.
  - **Lubrizol wants to add hinges.**
  - **Recommendation is to petition for small Golden Stand modifications on a case-by-case basis at the Surveillance Panel level.**
- Use of alternate pressure transducer fittings.

    - **Recommendation is to petition for small Golden Stand modifications on a case-by-case basis at the Surveillance Panel level.**
- Do we have or need to have a specific method for calibrating the standardized weight set manufactured for the Sequence IVB's load cell calibration?
    - **Recommendation is to add verbiage to procedure for labs to follow internal weight calibration procedures, with the option to send them back to the manufacturer for calibration.**
- There were two controlled parameters (with associated QI, BQD, etc.) that were not included in the list of 6-month calibrations. These are coolant pressure and load cell temperature. Sid has added them to Table 6 of the ASTM draft procedure.
    - **Done.**

Attachment 4

Sequence IVB Test Procedure Status

Updated: 5/4/2020
as of 12:45pm EST

Section	Description	Currently Assigned To	Final Revisions Completed	Converted to ASTM Format	Final Review Completed	Status Comments
Introduction	Introduction	N/A	YES	YES	YES	Completed and ready for Sequence IV Surveillance Panel vote and ASTM balloting.
Section 1	Scope	N/A	YES	YES	YES	Completed and ready for Sequence IV Surveillance Panel vote and ASTM balloting.
Section 2	Reference Documents	N/A	YES	YES	YES	Completed and ready for Sequence IV Surveillance Panel vote and ASTM balloting.
Section 3	Terminology	N/A	YES	YES	YES	Completed and ready for Sequence IV Surveillance Panel vote and ASTM balloting.
Section 4	Summary of Test Method	N/A	YES	YES	YES	Completed and ready for Sequence IV Surveillance Panel vote and ASTM balloting.
Section 5	Significance and Use	N/A	YES	YES	YES	Completed and ready for Sequence IV Surveillance Panel vote and ASTM balloting.
Section 6	Apparatus	N/A	YES	YES	YES	Completed and ready for Sequence IV Surveillance Panel vote and ASTM balloting.
Section 7	Reagents and Materials	N/A	YES	YES	YES	Completed and ready for Sequence IV Surveillance Panel vote and ASTM balloting.
Section 8	Oil Blend Sampling Requirements	N/A	YES	YES	YES	Completed and ready for Sequence IV Surveillance Panel vote and ASTM balloting.
Section 9	Preparation of Apparatus	N/A	YES	YES	YES	Completed and ready for Sequence IV Surveillance Panel vote and ASTM balloting.
Section 10	Data Acquisition, Reference Oil Application, Equipment Calibration and Maintenance	N/A	YES	YES	YES	Completed and ready for Sequence IV Surveillance Panel vote and ASTM balloting.
Section 11	Procedure	N/A	YES	YES	YES	Completed and ready for Sequence IV Surveillance Panel vote and ASTM balloting.
Section 12	Determination of Results	N/A	YES	YES	YES	Completed and ready for Sequence IV Surveillance Panel vote and ASTM balloting.
Section 13	Report	N/A	YES	YES	YES	Completed and ready for Sequence IV Surveillance Panel vote and ASTM balloting.
Section 14	Precision and Bias	N/A	YES	YES	YES	Completed and ready for Sequence IV Surveillance Panel vote and ASTM balloting.
Annex A1	ASTM Test Monitoring Center Organization	N/A	YES	YES	YES	Completed and ready for Sequence IV Surveillance Panel vote and ASTM balloting.

Sequence IVB Test Procedure Status

Updated: 5/4/2020
as of 12:45pm EST

Section	Description	Currently Assigned To	Final Revisions Completed	Converted to ASTM Format	Final Review Completed	Status Comments
Annex A2	ASTM Test Monitoring Center: Calibration Procedures	N/A	YES	YES	YES	Completed and ready for Sequence IV Surveillance Panel vote and ASTM balloting.
Annex A3	ASTM Test Monitoring Center: Maintenance Activities	N/A	YES	YES	YES	Completed and ready for Sequence IV Surveillance Panel vote and ASTM balloting.
Annex A4	ASTM Test Monitoring Center: Related Information	N/A	YES	YES	YES	Completed and ready for Sequence IV Surveillance Panel vote and ASTM balloting.
Annex A5	Camshaft and Lifter Measurements	N/A	YES	YES	YES	Completed and ready for Sequence IV Surveillance Panel vote and ASTM balloting.
Annex A6	Keyence VR-3000 Procedure	N/A	YES	YES	YES	Completed and ready for Sequence IV Surveillance Panel vote and ASTM balloting.
Annex A7	Thermocouples	N/A	YES	YES	YES	Completed and ready for Sequence IV Surveillance Panel vote and ASTM balloting.
Annex A8	Oil Separator and Blow-by Plumbing Insulation Procedure	N/A	YES	YES	YES	Completed and ready for Sequence IV Surveillance Panel vote and ASTM balloting.
Annex A9	List of Engine and Stand Parts Supplied by OHT and TEI	N/A	YES	YES	YES	Completed and ready for Sequence IV Surveillance Panel vote and ASTM balloting.
Annex A10	Test Fuel Chemical Specifications	N/A	YES	YES	YES	Completed and ready for Sequence IV Surveillance Panel vote and ASTM balloting.
Annex A11	Extended Shutdown Oxidation Protection Procedure	N/A	YES	YES	YES	Completed and ready for Sequence IV Surveillance Panel vote and ASTM balloting.
Annex A12	Stand Maintenance Procedure after a Camshaft Lobe Failure	N/A	YES	YES	YES	Completed and ready for Sequence IV Surveillance Panel vote and ASTM balloting.
Annex A13	Oxidation and Nitration Measurement Technique	N/A	YES	YES	YES	Completed and ready for Sequence IV Surveillance Panel vote and ASTM balloting.
Appendix X1	Engine Health Checklist	N/A	YES	YES	YES	Completed and ready for Sequence IV Surveillance Panel vote and ASTM balloting.
Appendix X2	Useful Information	N/A	YES	YES	YES	Completed and ready for Sequence IV Surveillance Panel vote and ASTM balloting.

NOTE: Last step is to assemble all sections, annexes and appendices into a single Word Document and set page breaks.

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IVB Lab Differences and Recent Severity Trends

All Reference data reported through 4/25/20

Summary of Review

- Matrix Data
  - Suggested lab severity differences for both AVL and Fe
- All data (matrix and subsequent reference data)
  - Suggests some significant lab differences still exist for both AVL and FE
- Severity differences appear to be driven by two stands in lab B
  - Suggests some stand differences for FE
  - Recent trends show two stands in lab A have begun to go severe over the last two tests.
  - Appear to be causing recent Severity alarms

Model Output for AVLI and FE

AVLIYi Model Output

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	10	17.12638079	1.71263808	2.34	0.0206
Error	62	45.38617135	0.73203502		
Corrected Total	72	62.51255214			

R-Square	Coeff Var	Root MSE	AVLIyi Mean
0.273967	468.2683	0.855590	0.182714

Source	DF	Type I SS	Mean Square	F Value	Pr > F
LTMSLAB	4	11.52245068	2.88061267	3.94	0.0065
LTMSLAB*LTMSAPP	6	5.60393011	0.93398835	1.28	0.2815

FeYi Model Output

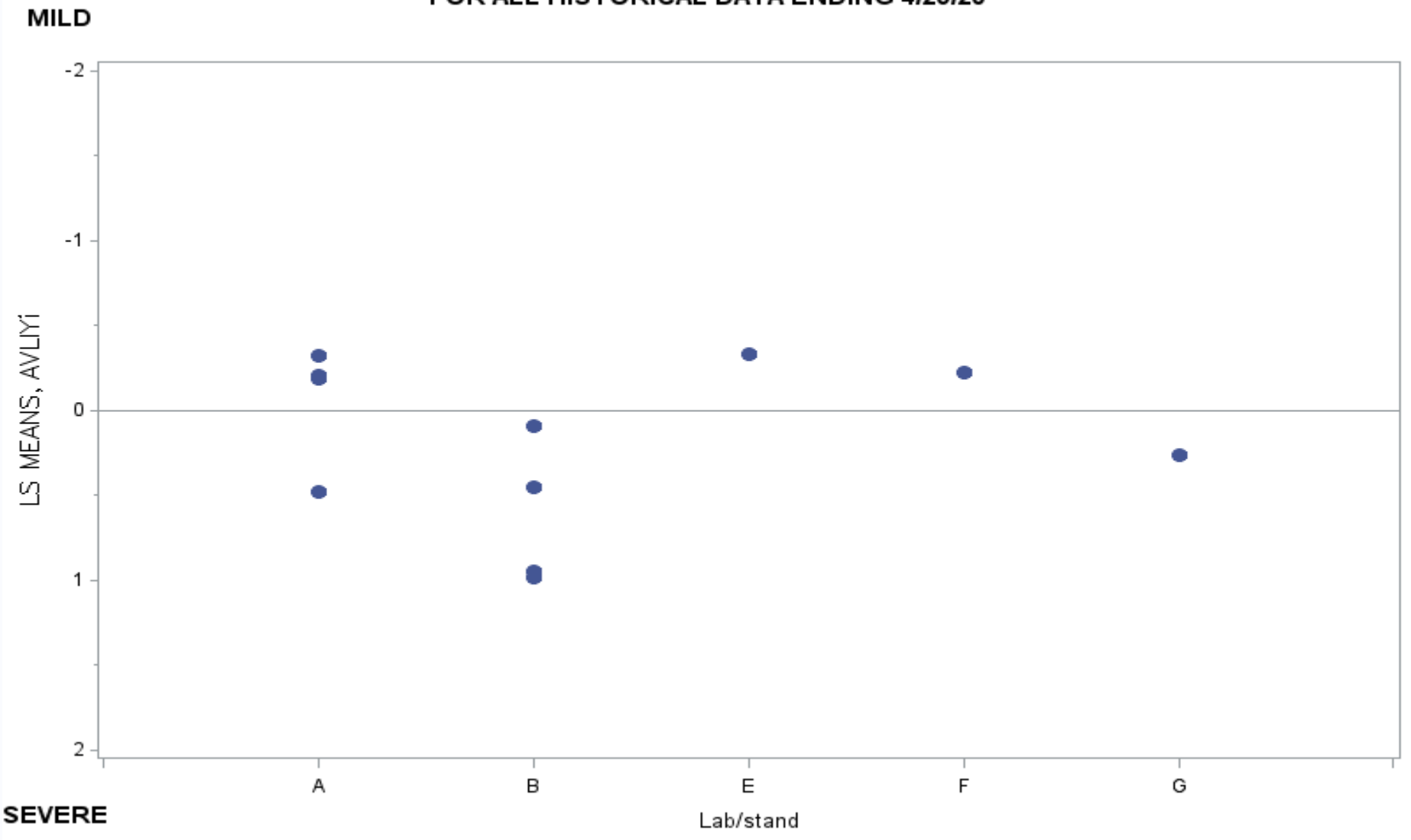
Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	10	22.31028540	2.23102854	4.14	0.0002
Error	62	33.42320511	0.53908395		
Corrected Total	72	55.73349051			

R-Square	Coeff Var	Root MSE	FEyi Mean
0.400303	606.6771	0.734223	0.121024

Source	DF	Type I SS	Mean Square	F Value	Pr > F
LTMSLAB	4	13.78973853	3.44743463	6.39	0.0002
LTMSLAB*LTMSAPP	6	8.52054687	1.42009114	2.63	0.0243

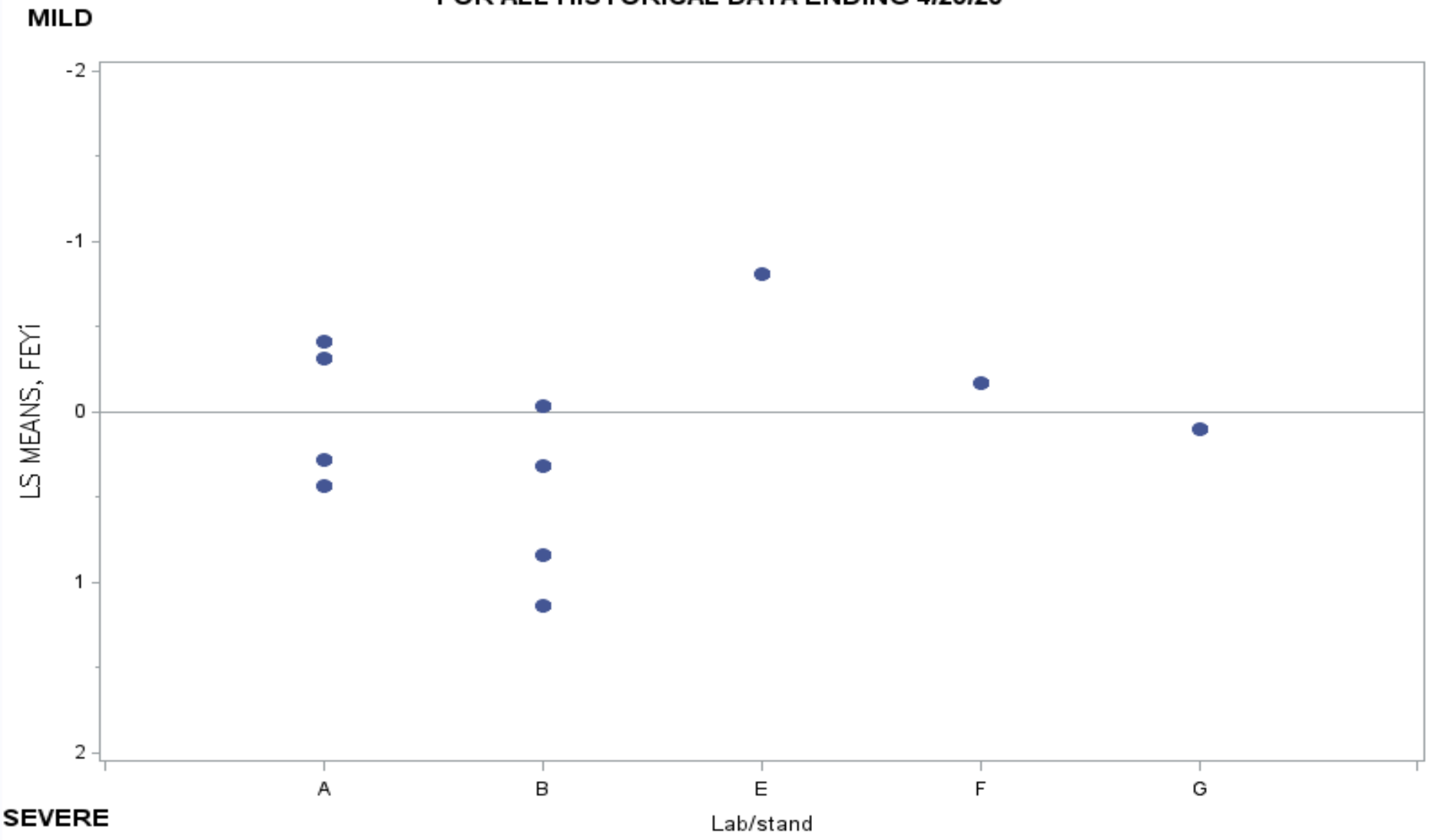
Sequence IVB

LS MEAN for LTMSLAB and STAND
FOR ALL HISTORICAL DATA ENDING 4/25/20



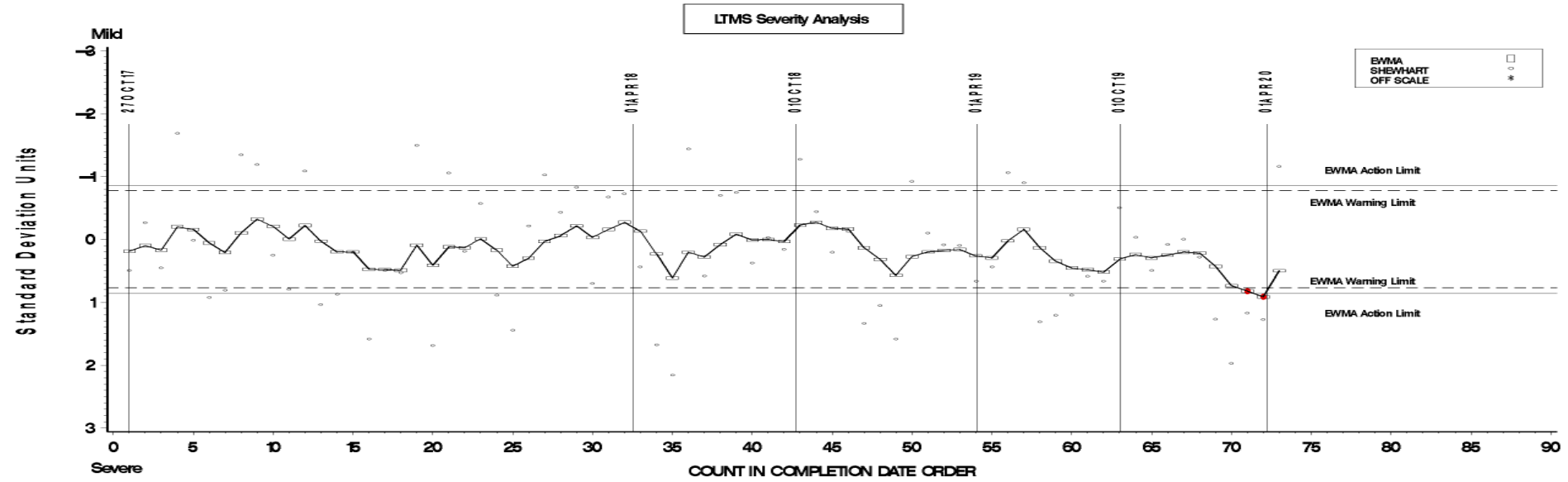
Sequence IVB

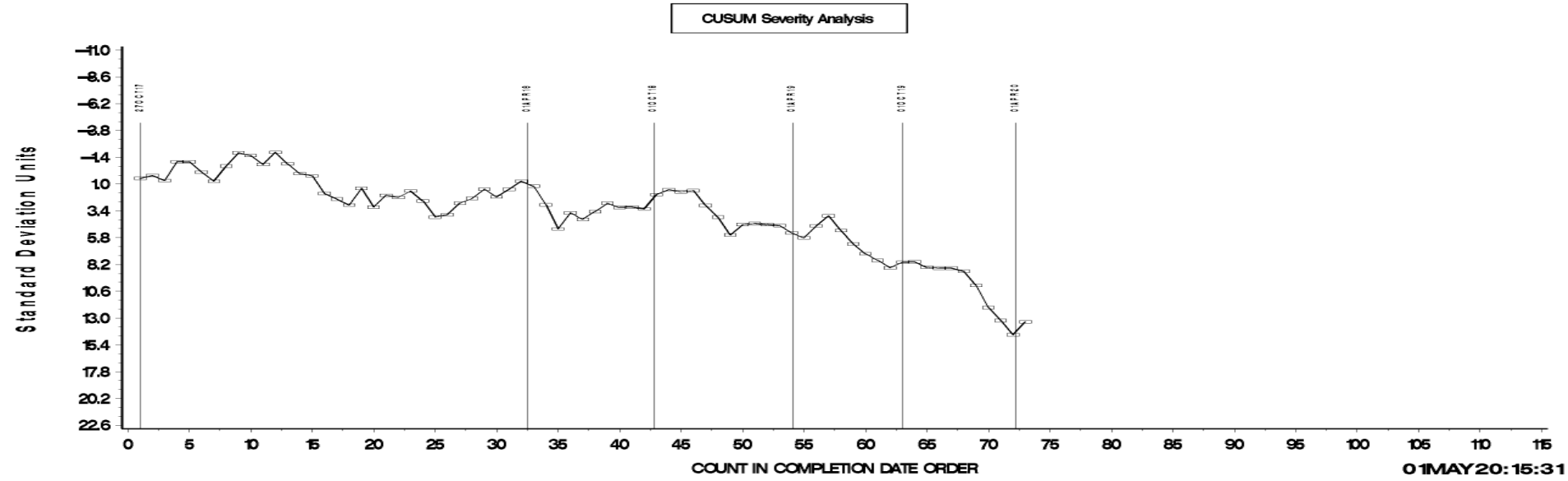
LS MEAN for LTMSLAB and STAND
FOR ALL HISTORICAL DATA ENDING 4/25/20



SEQUENCE IVB INDUSTRY OPERATIONALLY VALID DATA

AVERAGE VOLUME LOSS BY KEYENCE INTAKE Final





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Test Monitoring Center
http://astmtmc.cmu.edu

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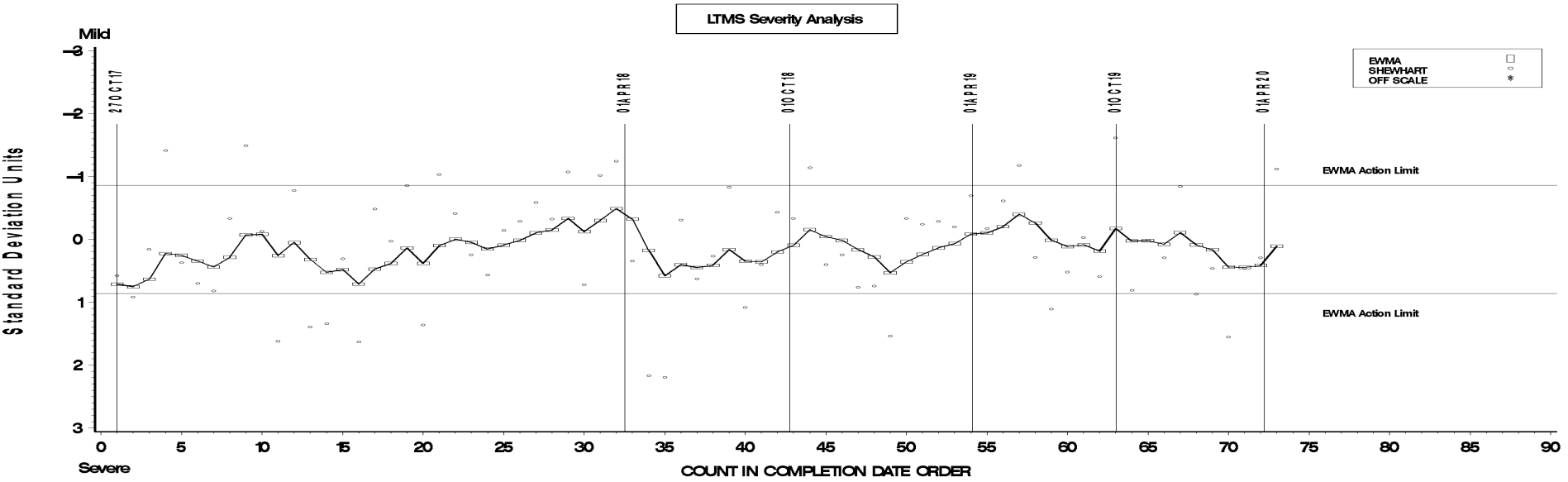
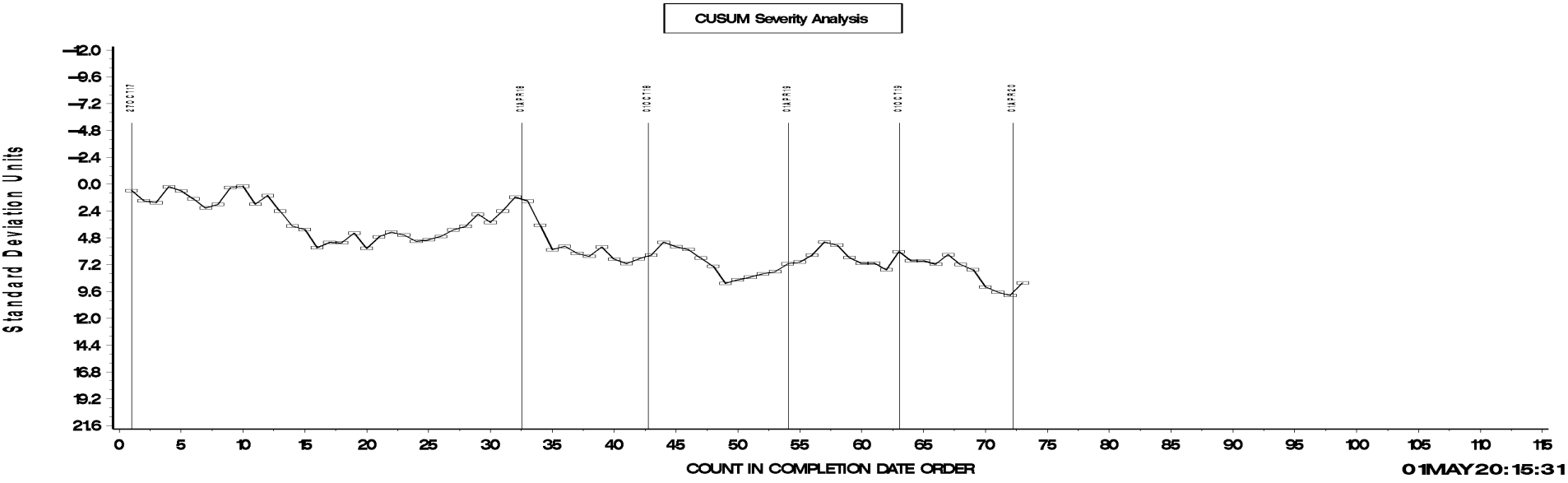
SEQUENCE IVB INDUSTRY OPERATIONALLY VALID DATA

END OF TEST FE FINAL Severity Adjusted RESULT





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Test Monitoring Center
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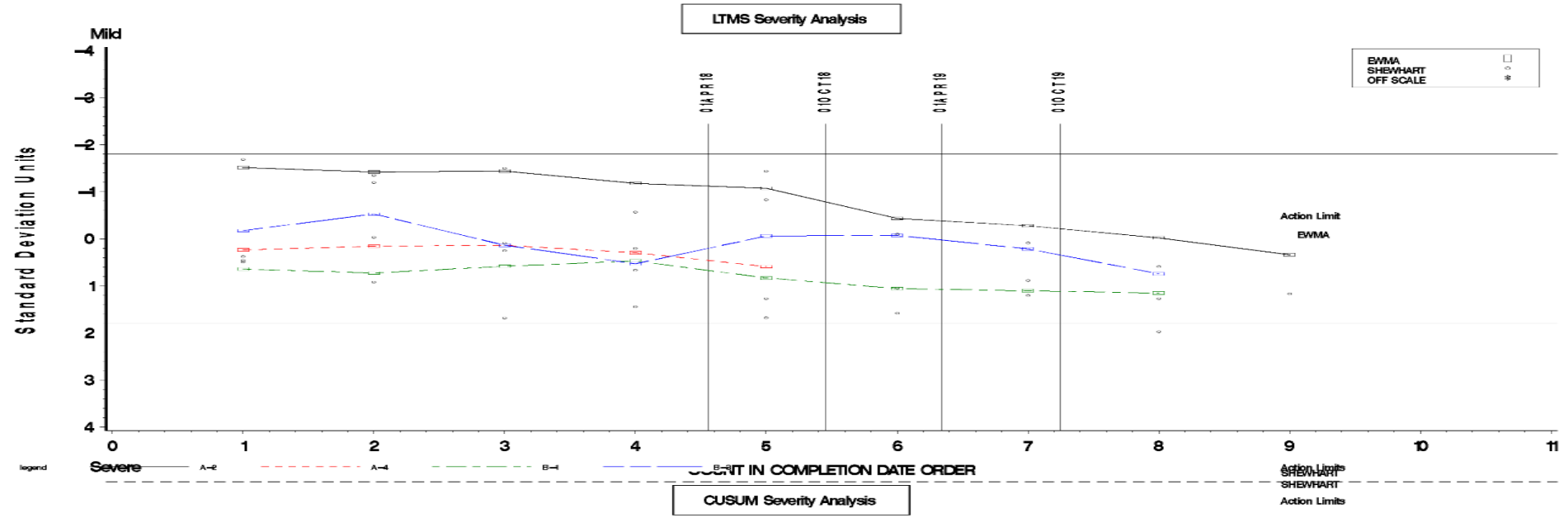
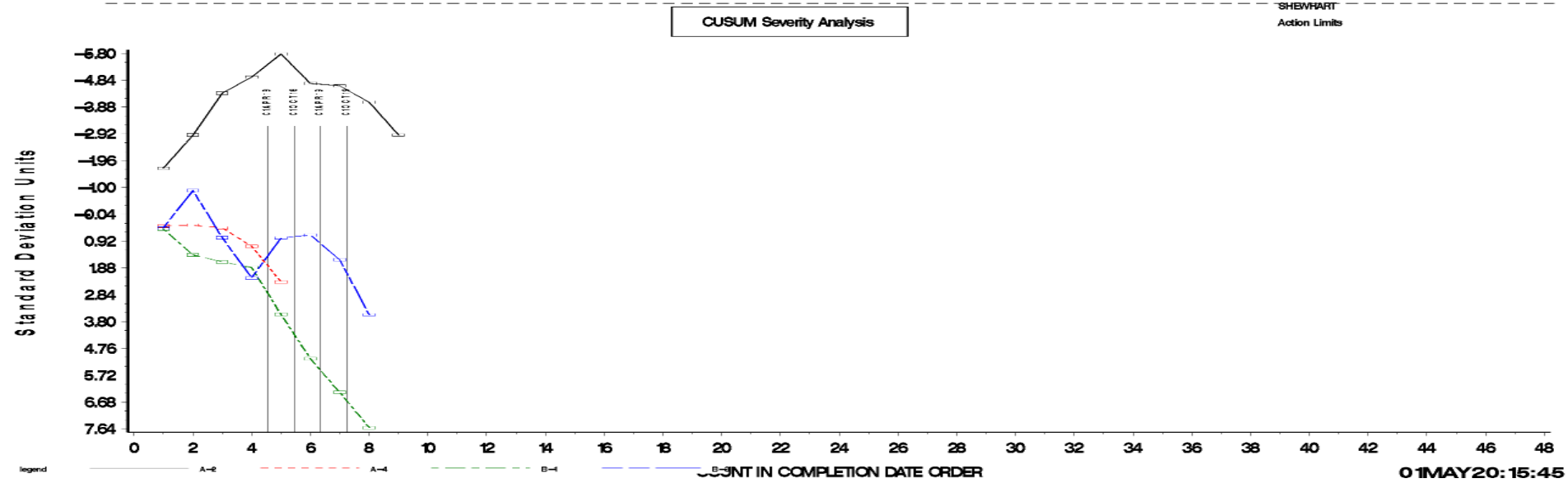
SEQUENCE IVB APPARATUS OPERATIONALLY VALID DATA

AVERAGE VOLUME LOSS BY KEYENCE INTAKE Final





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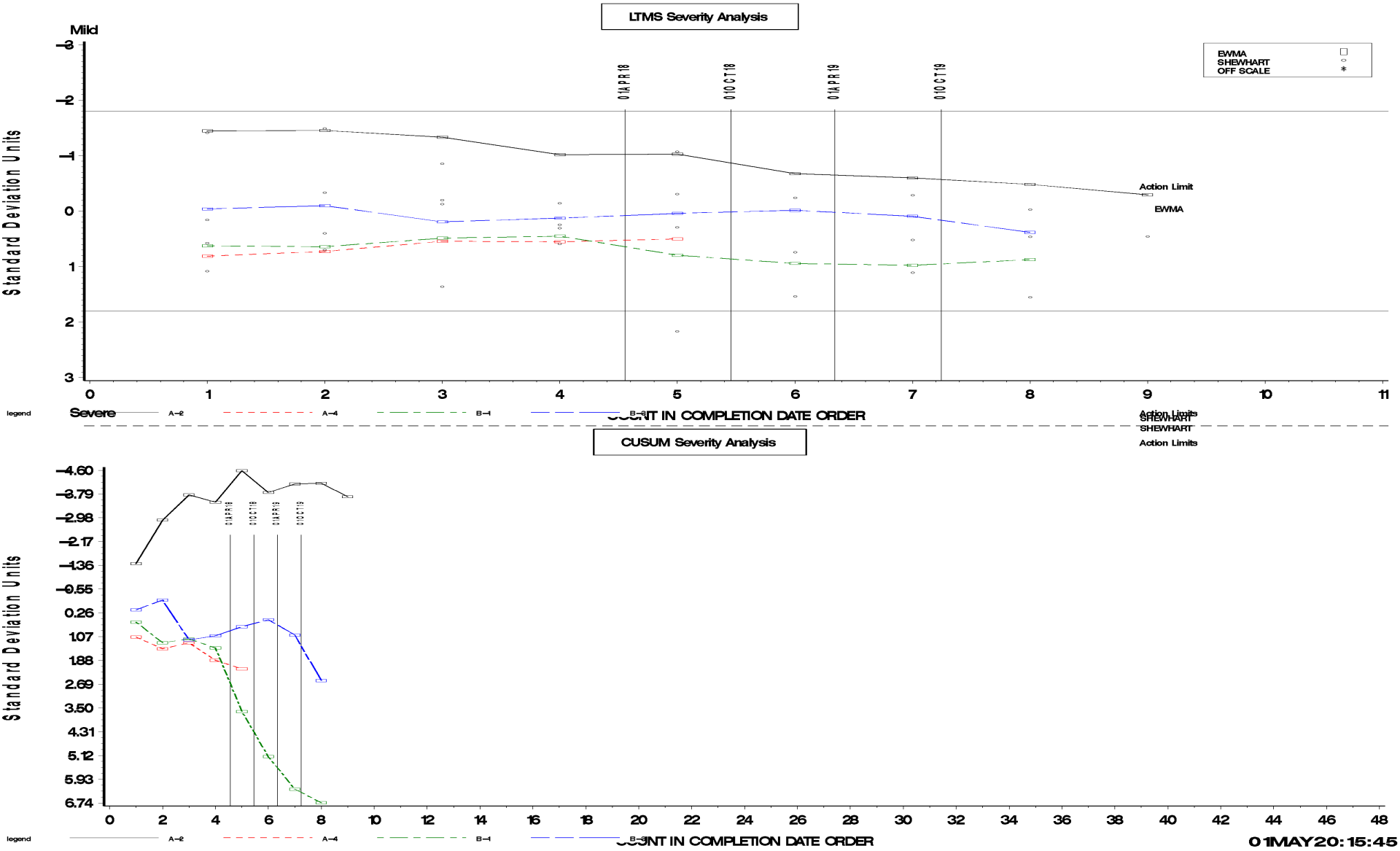
SEQUENCE IVB APPARATUS OPERATIONALLY VALID DATA

END OF TEST FE FINAL Severity Adjusted RESULT



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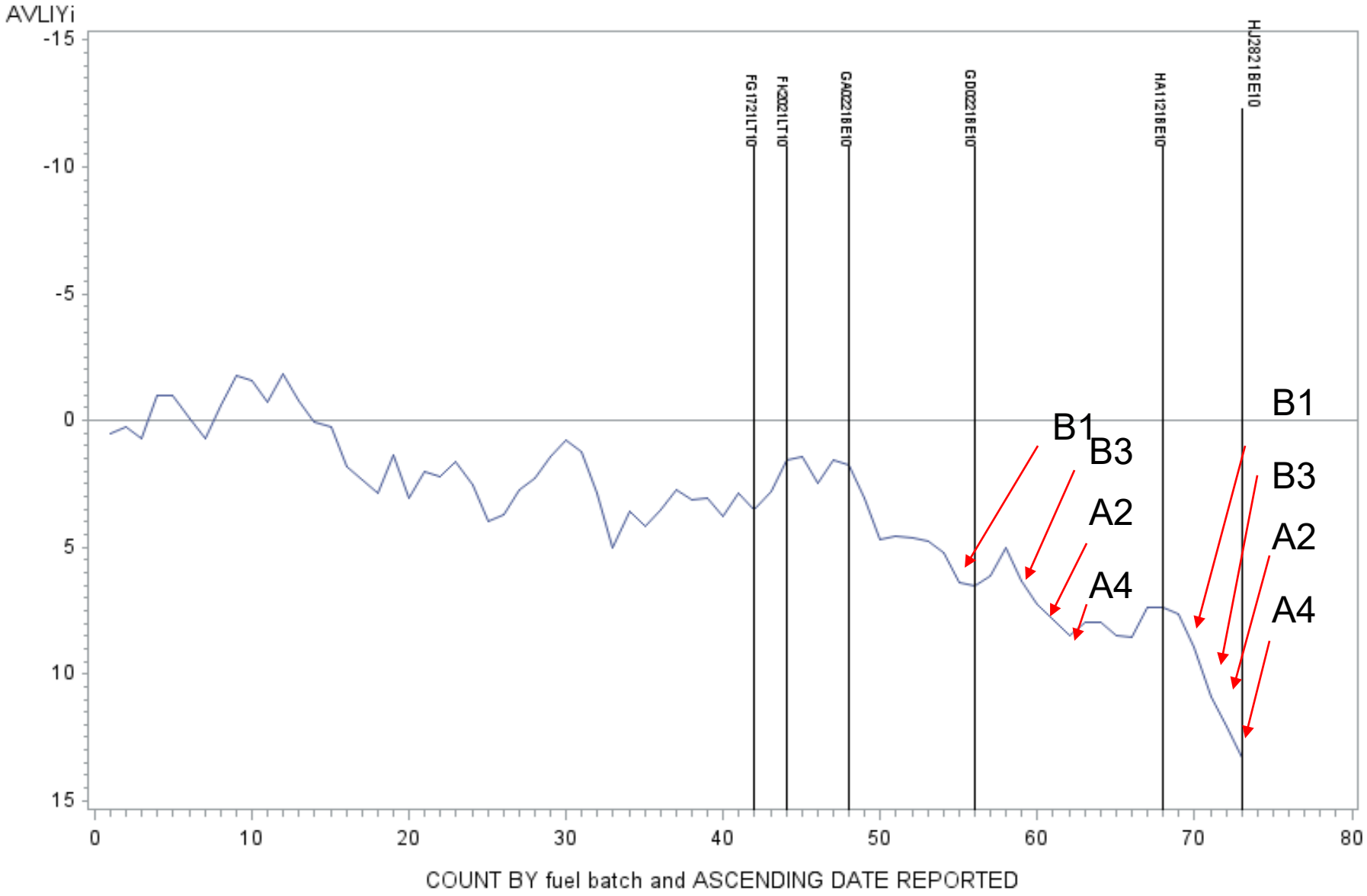
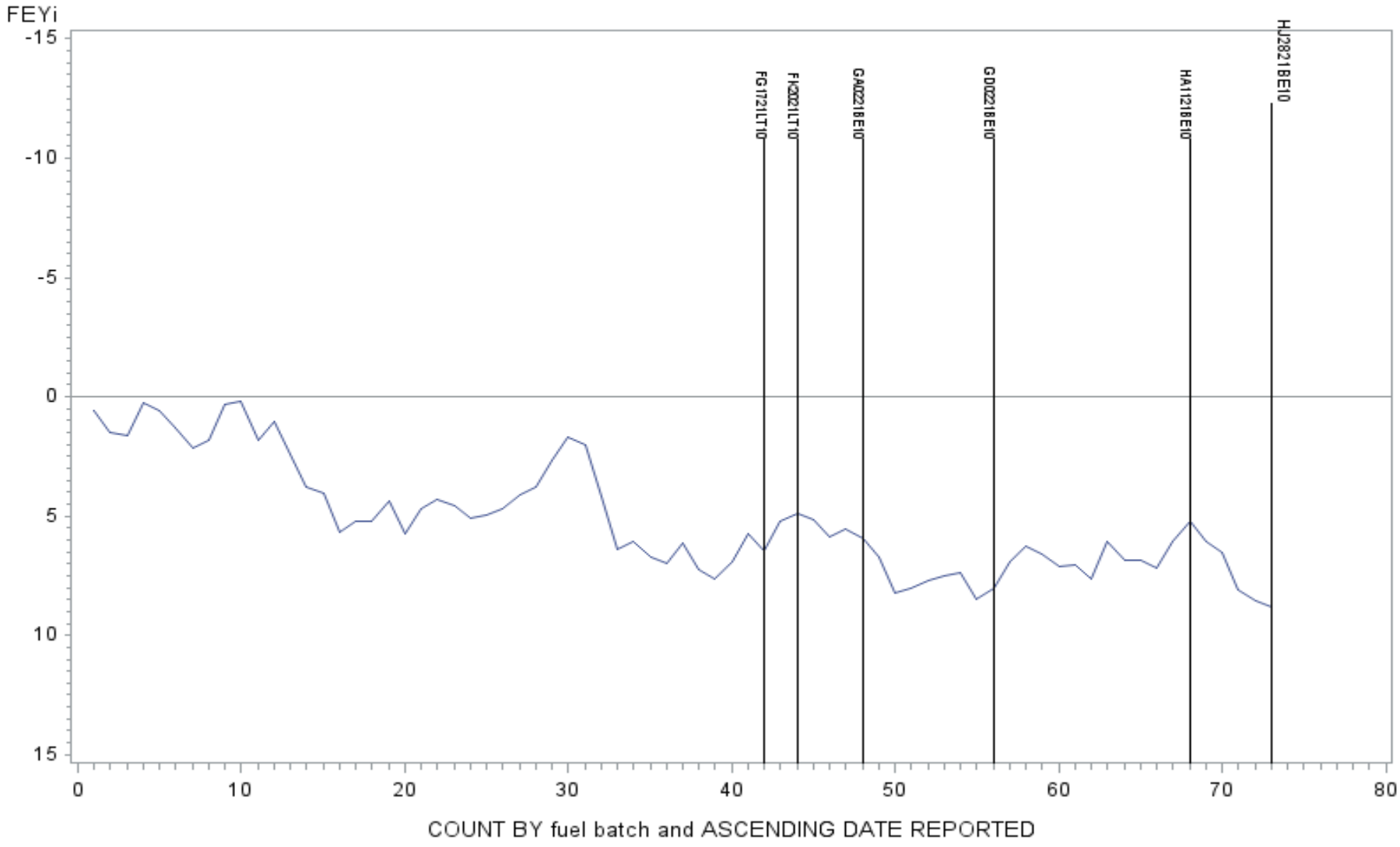
Sequence IVB

Summation Delta/s by Fuel Batch



Sequence IVB
Summation Delta/s by Fuel Batch



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Attachment 6

How to report a Sequence IVB test with lobe failure(s)

Candidate test experienced lobe failure(s), but runs full duration:

N / has

No. 2 The laboratory ran this test for the full duration following all procedural requirements; and all operational validity requirements of the latest version of the applicable test procedure (ASTM or other), including all updates issued by the organization responsible for the test, were met.

Yes ___X____ No_____*

If the response to this Declaration is "No", does the test engineer consider the deviations from operational validity requirements that occurred to be beyond the control of the laboratory?

Yes _____* No_____

No. 3 A deviation occurred for one of the test parameters identified by the organization responsible for the test as being a special case. Yes ___X___* No_____ (This currently applies only to specific deviations identified in the ASTM Information Letter System)

Candidate test experienced lobe failure(s), and is terminated early:

N / has not

No. 2 The laboratory ran this test for the full duration following all procedural requirements; and all operational validity requirements of the latest version of the applicable test procedure (ASTM or other), including all updates issued by the organization responsible for the test, were met.

Yes _____ No___X___*

If the response to this Declaration is "No", does the test engineer consider the deviations from operational validity requirements that occurred to be beyond the control of the laboratory?

Yes ___X___* No_____

No. 3 A deviation occurred for one of the test parameters identified by the organization responsible for the test as being a special case. Yes ___X___* No_____ (This currently applies only to specific deviations identified in the ASTM Information Letter System)

Attachment 7

Sequence IV Surveillance Panel
May 4, 2020
12:00PM – 2:00PM
Conference Call

Motions and Action Items
As Recorded at the Meeting by Bill Buscher

1. Motion – The Sequence IV Surveillance Panel recommends that the Sequence IVB test procedure (dated 5/4/2020) be sent forward for an ASTM B ballot to approve the Sequence IVB as a new ASTM test procedure.
   Ron Romano / Bill Buscher / Passed Unanimously 17 – 0 – 0

2. Action Item – Rich Grundza to check with ACC monitoring on a discrepancy of reporting Sequence IVB tests experiencing lobe failure(s).

3. Motion – The addition of 12.5.9 *Assessment of Interpretability*, to the Sequence IVB test procedure (dated 5/4/2020), which is included in the version that will be balloted, is acceptable to the Sequence IV Surveillance Panel.
   Bill Buscher / Rich Grundza / Passed Unanimously 17 – 0 – 0