

Report of Meeting
L-37-1 Surveillance Panel Conference Call
May 11th, 2022

Attendees:

SwRI -	Mueller , Kostan, Charron
Lubrizol -	Venhoff, Slocum , Bealko
Afton -	Sangpeal , Bell, Horvath
Intertek -	Lange
TMC -	Beck , Grundza
ExxonMobil -	Banas
BASF -	Goyal , Mosher, Caridi
Dana -	Zyski
Meritor -	LaBond, Carter
Army -	
AAM -	Muransky
Shell -	Uy, Jordan
Chevron -	Martinez
	Dvorak

Voting Members in **BOLD**

1.0 Membership Review

-No Change

2.0 Meeting minutes Approval

– February 9th, 2022, ASTM Meeting

Motion #1 → A. Zyski 1st /2nd J. Carter to approve the meeting minutes from the February 9th, 2022, ASTM Meeting. Motion passed unanimously, 10-0-0 (Yes-No-Abstain).

3.0 L-37-1 LTMS/TCR Discussion

Action Items:

- **TMC provided TCR's to the labs generated with the recommended values of lambda .30, Zi limit +/- 1.2, Ei limit level 3 +/- 2.066 and level 2 +/- 1.734 to see if it would have any effect on labs current calibration status**
- **One lab would have been affected at the Zi of 1.2 for Rippling**
- **TMC to recalculate TCR's using more commonly industry used Zi of 1.5**
- **May need to address implementation of severity adjustments**
- **Will still need to decide how to treat Pitting/Spalling**
 - **Reported as non-critical parameter??**
 - **Acceptance bands??**

4.0 Gleason Hardware Approval Matrix

Action Items:

- Each lab will need to run 3 tests running Gleason 2021 Uncoated
- (1) each 134-1, 155-1, 152-2
- Hope to achieve in 3-4 weeks

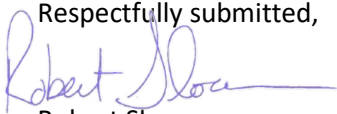
5.0 Old Business

- Additional “Lubrited” word changes
 - Present in TMC oil assignment requests
 - Value in’s report templates
 - “TESTHARD”
 - “LRHARD”
- Muransky/Zyski were able to find some nominal specs for MnP coating

6.0 Adjourn

Motion #2 → T. Muransky 1st /2nd A. Goyal to adjourn. Motion passed unanimously, 10-0-0 (Yes-No-Abstain).

Respectfully submitted,



Robert Slocum

L-37-1 Surveillance Panel Chairman



D02.B0.03

L-37-1 Surveillance Panel Meeting

05/11/2022

11:30 am – 12:30 pm

Robert Slocum

Agenda

- Call to Order/Agenda review
- Membership Review
- Meeting Minute Approvals
- February 9th, 2022, ASTM Meeting
- L-37-1 LTMS/TCR Discussion
- Gleason Hardware Approval Matrix
- Old Business
 - Additional “Lubrited” word changes
- New business
- Adjournment

Membership Review

Rob Banas	ExxonMobil
Allen Comfort	US Army
Troy Muransky	AAM
Matt Sangpeal	Afton
Arjun Goyal	BASF
Amy Zyski	Dana
Dylan Beck	TMC
Jason Carter	Meritor
Anthony Lange	Intertek
Robert Slocum	Lubrizol
Caroline Mueller	SwRI
Kaled Zreik	GM
Mike Cabaj	Linamar

Total Voting Members = 13

Meeting Minutes Approval

- February 9th, 2022, ASTM Meeting

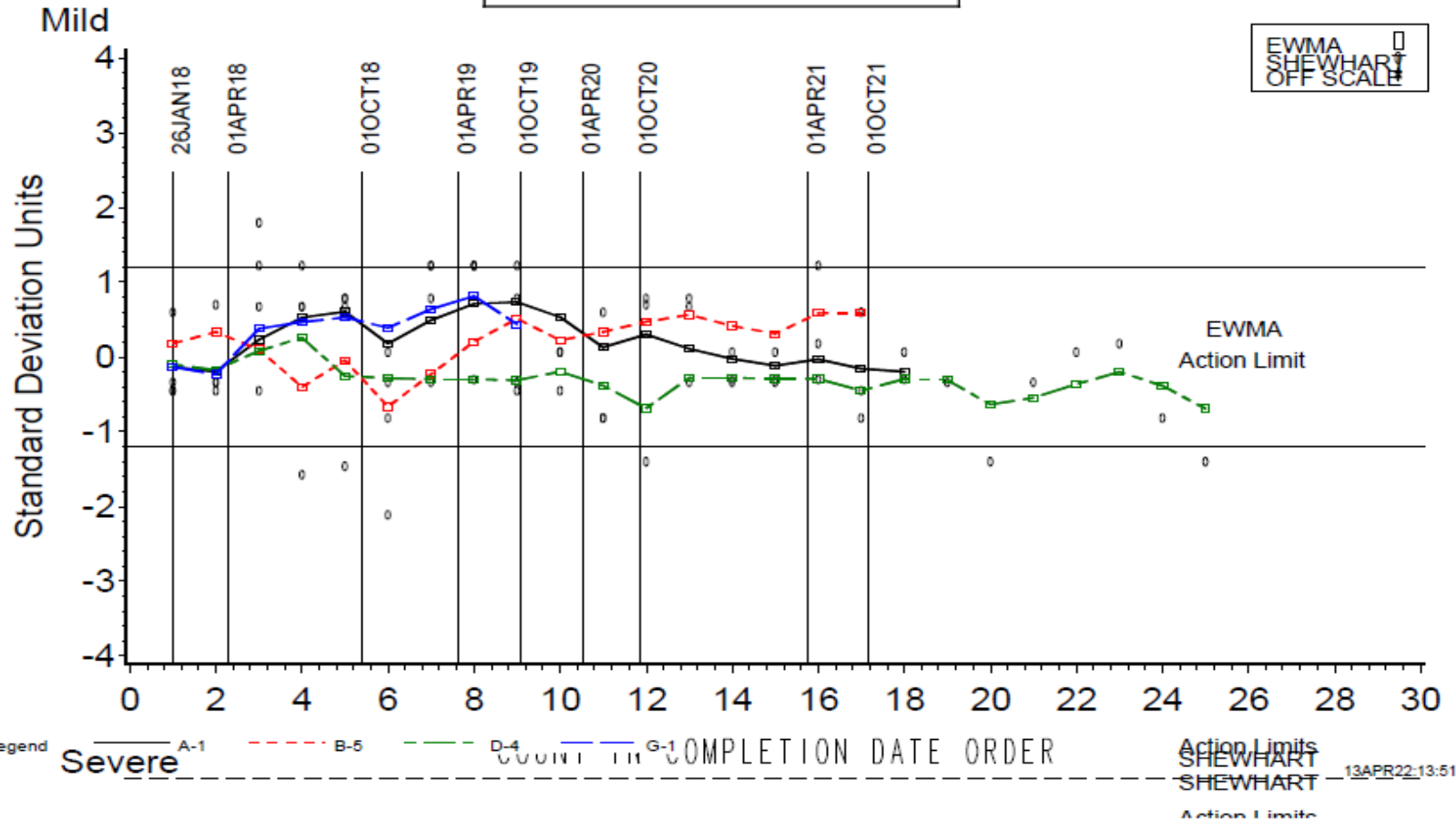
L-37-1 LTMS/TCR Discussion

L-37-1N APPARATUS OPERATIONALLY VALID DATA

FINAL PINION GEAR RIDGING



LTMS Severity Analysis



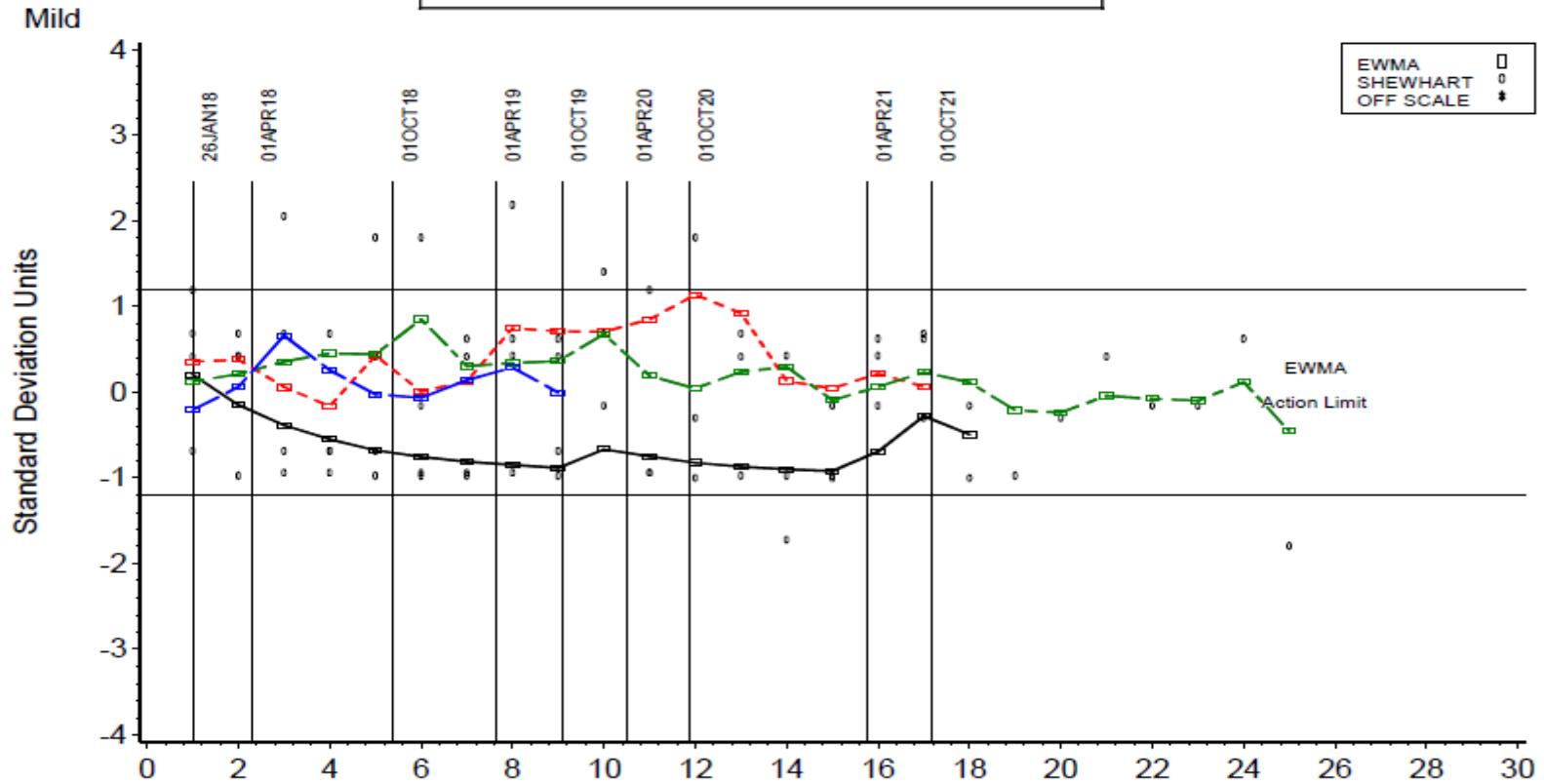
L-37-1 LTMS/TCR Discussion

L-37-1N APPARATUS OPERATIONALLY VALID DATA

FINAL PINION GEAR WEAR



LTMS Severity Analysis



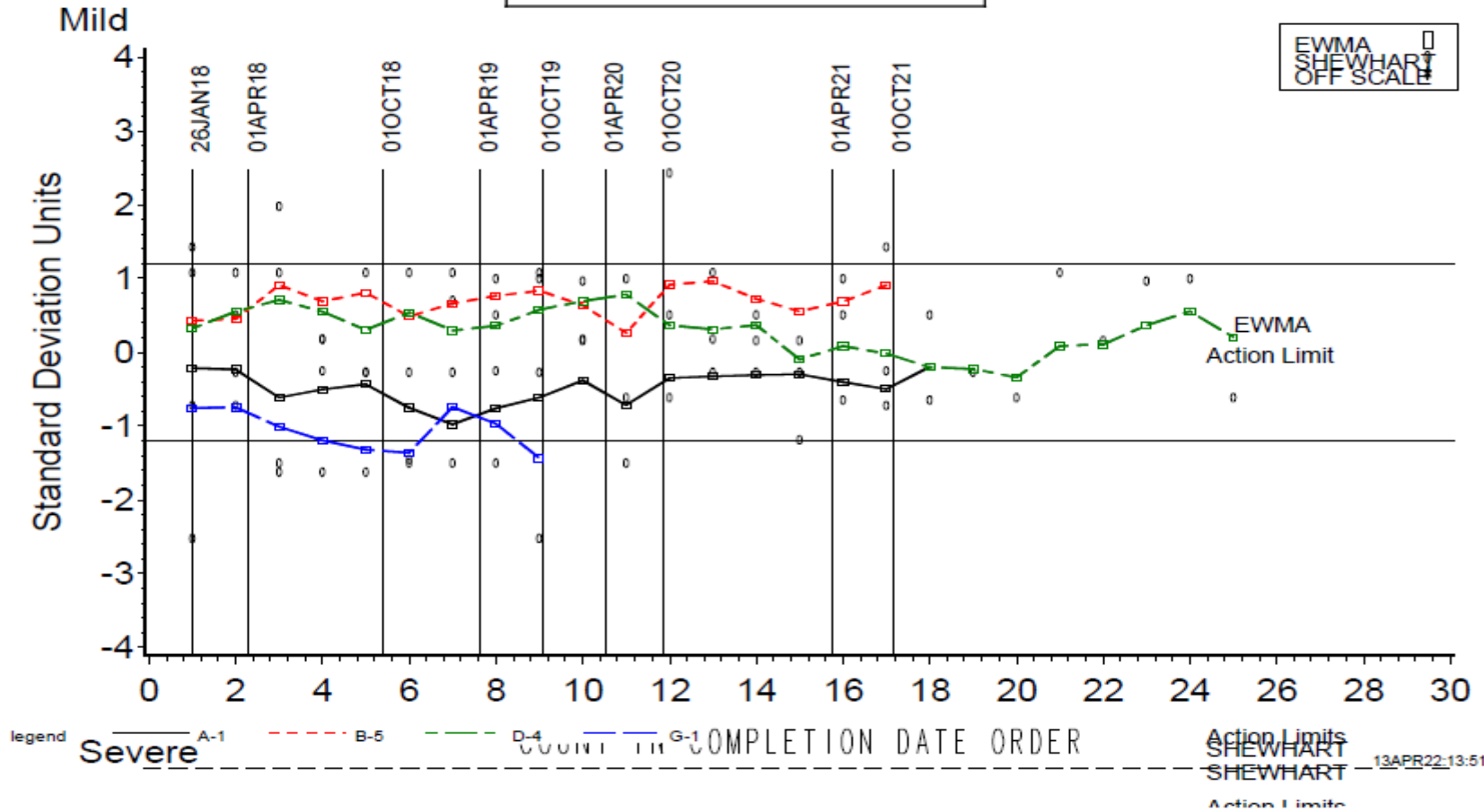
L-37-1 LTMS/TCR Discussion

L-37-1N APPARATUS OPERATIONALLY VALID DATA

FINAL PINION GEAR RIBBLING



LTMS Severity Analysis



Background

- Current L-37-I LTMS includes:
 1. Stand EWMA (Z_i) with $\lambda = 0.3$
 - No consequences for exceeding limit
 2. Stand Shewhart Severity (Y_i)
 - Fail if beyond +/- 1.8 standard deviations from target.
 - Integer-valued parameters cause problems here (discussed previously)
 3. If calibration test on 134 or subsequent reblends, it must fail for at least one of the five parameters based on GL-5 limits.
 4. Industry precision and severity also control charted.
- LTMS changes considered in this analysis include:
 1. Updates to oil means and standard deviations.
 2. Implementation of Z_i and E_i as calibration pass/fail parameters instead of Y_i .

Summary of Targets

Below is a summary of the targets, along with the pooled standard deviations to be used for severity adjustments.

Ridging

Oil	Hardware	Mean	S.D.
134/134-1	Nonlubrited	4.4	0.89
152-2	Nonlubrited	9.3	0.89
155-1	Nonlubrited	9.4	0.49
134/134-1	Lubrited	4.9	0.6
152-2	Lubrited	9.6	0.5
155-1	Lubrited	9.3	0.59

Wear

Oil	Hardware	Mean	S.D.
134/134-1	Nonlubrited	5.5	0.73
152-2	Nonlubrited	7.7	0.72
155-1	Nonlubrited	7.6	0.64
134/134-1	Lubrited	6.1	0.64
152-2	Lubrited	8.2	0.67
155-1	Lubrited	7.7	0.7

Rippling

Oil	Hardware	Mean	S.D.
134/134-1	Nonlubrited	7.8	1.11
152-2	Nonlubrited	8.2	0.74
155-1	Nonlubrited	8.2	0.8
134/134-1	Lubrited	6.8	1.24
152-2	Lubrited	9.3	0.49
155-1	Lubrited	8.7	0.59

Severity Adjustment Standard Deviations

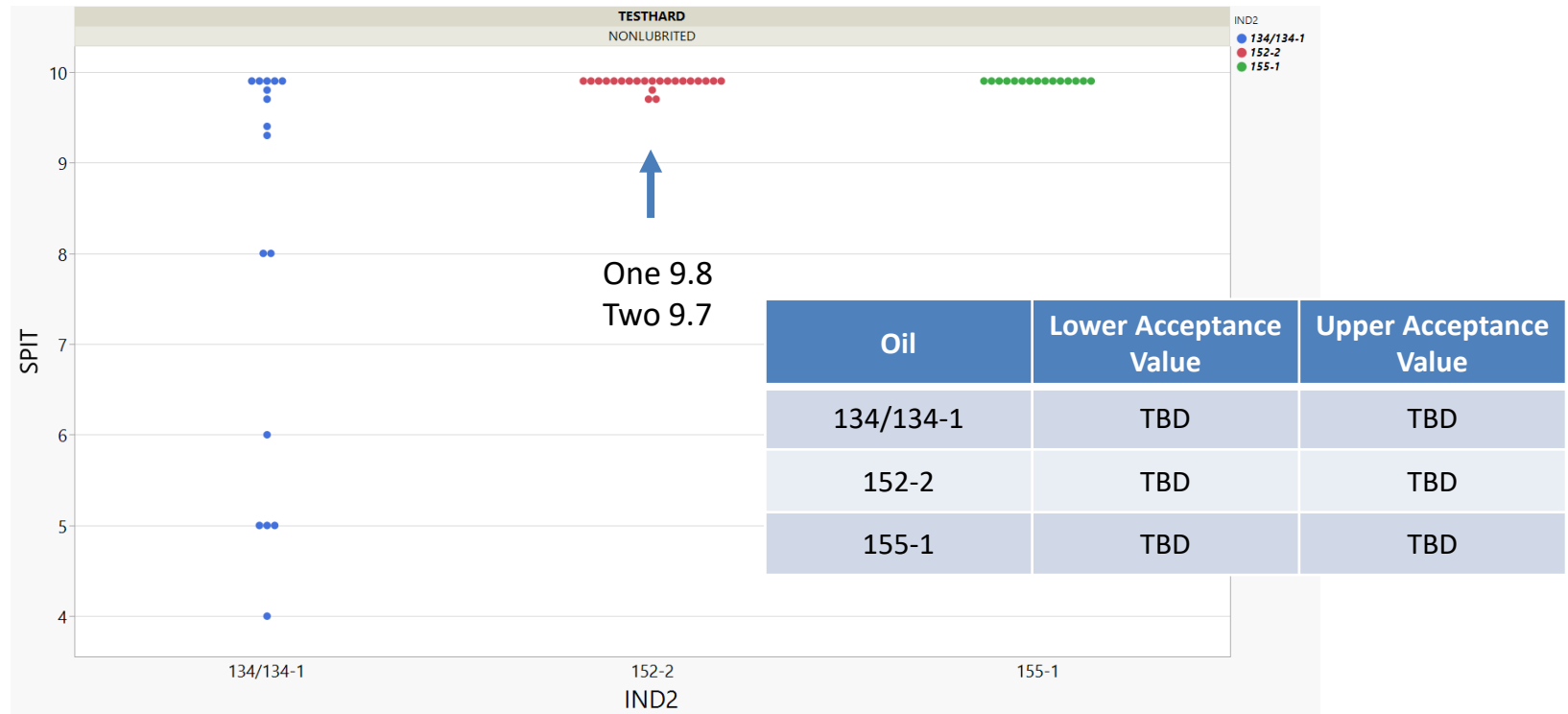
Parameter	Hardware	Pooled S	Option Using 152-2 and 155-1 Only
Ridging	Nonlubrited	0.80	0.69
Rippling	Nonlubrited	0.88	0.77
Wear	Nonlubrited	0.70	0.68
Ridging	Lubrited	0.67	0.55
Rippling	Lubrited	0.89	0.54
Wear	Lubrited	0.67	0.69

Background

At the September 2019 meeting, it was determined that this parameter would move to a Go/No-Go form of acceptance, meaning a reference passes if it achieves a value in a pre-determined, fixed range, and fails otherwise. The Surveillance Panel requested individual plots by oil in order to determine those ranges.

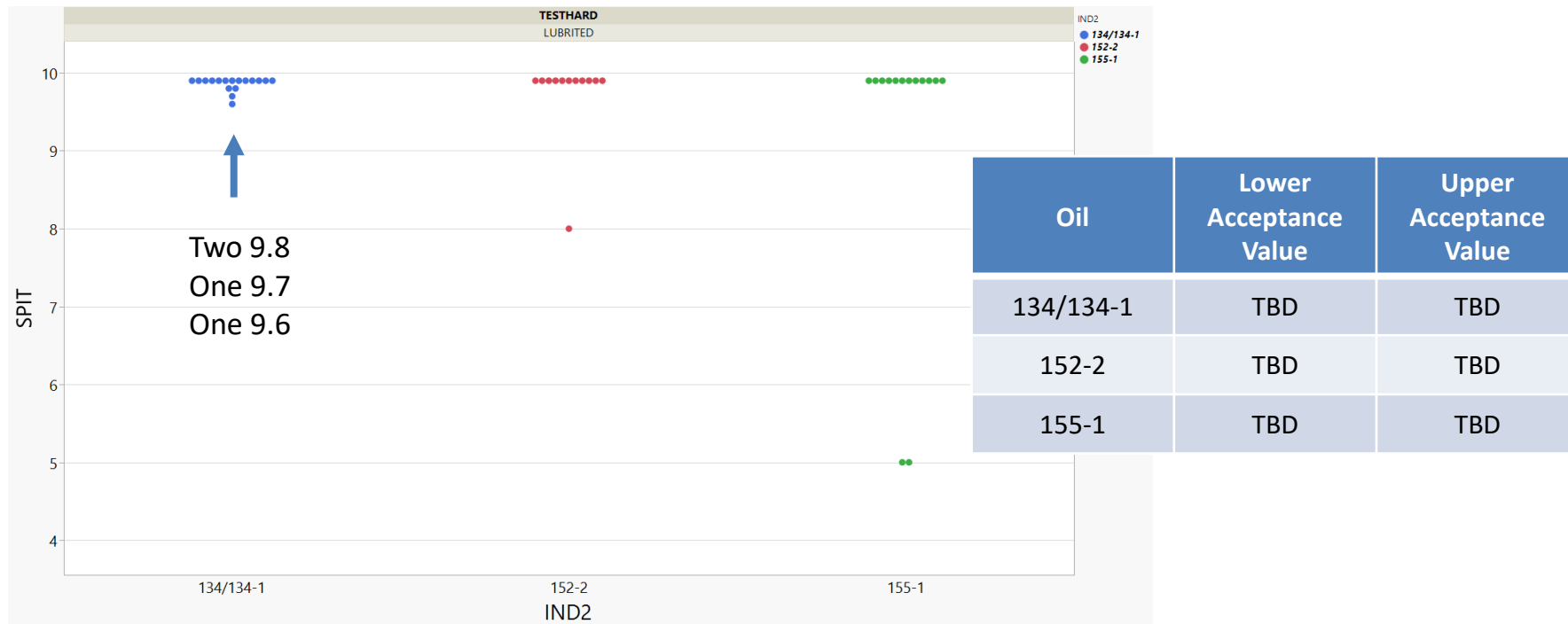
Pitting/Spalling for Nonlubricated Hardware

The data is plotted below to help determine upper and lower acceptance values for pitting/spalling.



Pitting/Spalling for Lubricated Hardware

The data is plotted below to help determine upper and lower acceptance values for pitting/spalling.



Constants and Limits to Decide

The following are potential constants and limits to use for Z_i and E_i :

- Lambda – Recommend to use 0.30
 - Z_i is updated by $Z_i = \lambda * Y_i + (1 - \lambda) * Z_{i-1}$
- Z_i limit – Recommend to use +/-1.2 to +/-1.5
 - Your stand EWMA can drift up to Z_i standard deviations from target
- E_i limits – Recommend to use level 3 limit of +/-2.066 and level 2 limit of +/-1.734
 - Each new calibration test result (Y_i) must be within 2.066 standard deviations of where we thought the stand was performing (Z_{i-1}).
- Decide whether or not to adopt severity adjustments
- Acceptance bands for Pitting/Spalling

Gleason Hardware Approval Matrix

- Afton Hardware status?
- Still no response from Gleason on inconsistent shipments

Old Business

- Additional “Lubrited” word changes
 - So far D8165 addressed 6.2.1
- Other Considerations
 - D6121 may have 30+ instances of “Lubrited”
 - Present in TMC oil assignment requests
 - Value for “TESTHARD” in report templates

New Business



D02.B0.03

L-37-1 Surveillance Panel Meeting

Adjourn