IVB Metrology Sub-Group | MINUTES

REVISION DATE: 7/2/2018 2:50:00 PM

Relevant Test:	Sequence IVB
Note Taker:	Chris Mileti
Meeting Date:	06-27-2018
Comments:	This was the "kick-off" conference call for the Sequence IVB Metrology Sub-Group.

1. REVIEW OF AGENDA AND ACTION ITEMS:

1.1. Background:

1.1.1. The Sequence IV Surveillance Panel recently formed two sub-groups to address the open Sequence IVB action items.

1.1.1.1. The first sub-group is tasked with improving test precision.

1.1.1.2. The second sub-group is tasked with finalizing the test procedure.

1.1.2. Lubrizol recently recommended that a third sub-group be formed to work on the metrology-related action items.

1.1.2.1. The members of the original two sub-groups agreed with this recommendation.

1.2. Current Metrology Action Items:

1.2.1. Develop a D.O.E. (Round-Robin) to compare the Keyence units at each of the five participating laboratories.

1.2.2. Provide input to the two original sub-groups regarding what metrology data should be included in the IVB test report.

1.2.3. Develop a procedure to use the Keyence G2 software to screen lifter profiles.

1.2.4. Determine whether the Keyence instruments should be monitored in LTMS.

1.3. Agenda for this Meeting:

1.3.1. Chris Mileti (Lubrizol) will lead this meeting.

1.3.1.1. He will also compile minutes and action items for all future meetings.

1.3.2. The agenda for this meeting is simple:

1.3.2.1. Agree on a frequency and format for future meetings.

1.3.2.2. Review the existing action items.

1.3.2.3. Prioritize the existing action items in terms of importance and difficulty to complete.

1.3.2.4. Determine if any "open" action items were accidentally omitted from the original list.

1.3.2.5. Begin assigning tasks to individual labs.

2. DISCUSSION:

2.1. Meeting Frequency and Format:

2.1.1. The attendees agreed to have a conference call every two weeks.
2.1.2. Lubrizol committed to issuing agendas, meeting minutes and action items.
2.1.3. Afton will be unable to participate in any conference calls between July 10th and July 12th.
2.1.3.1. The Afton metrology technicians will be at Lubrizol's facility (Cleveland, OH) for the Gear Rating Workshop.

2.2. Additional Action Items:

2.2.1. There was a consensus among the group that there are no additional action items to add to the list.

2.3. Develop D.O.E. to Compare All Five Keyence Units:

2.3.1. Lubrizol Review of Previous Round-Robins:

2.3.1.1. The three original labs (Intertek, Lubrizol and Southwest) previously conducted three separate round-robin experiments.
2.3.1.2. These experiments were designed by Kevin O'Malley (Statistics Group).
2.3.1.3. Statistical differences between labs were identified.
2.3.1.4. The results from these three round-robins should be reviewed by this sub-group.

2.3.2. Pre-Test and Post-Test Measurements:

2.3.2.1. There was a lot of debate as to whether only pre-test measurements should be included in the round-robin.
2.3.2.2. Limiting the round-robin to pre-test measurements only would make the associated logistics much simpler.
2.3.2.3. However, using both pre-test and post-test measurements would provide a stronger tie-back to the test itself (because the actual pass/fail parameter is volume loss).

2.3.3. There was concern within the group as to how a Keyence unit will be "fixed" if it is found to be different than the other four macroscopes.
2.3.3.1. The manufacturer must send the macroscopes back to Japan for repairs.

2.3.4. LTMS System:

2.3.4.1. The statisticians have proposed adding the Keyence units to LTMS.
2.3.4.2. Periodic verification data could be uploaded to LTMS to monitor for severity and performance shifts.
2.3.4.3. One of the benefits to using LTMS is that small shifts in instrument performance could (theoretically) be handled by severity adjustments instead of repairs.

2.3.5. BOI/VGRA Matrix:

2.3.5.1. Intertek may be willing to use one of their new BOI/VGRA engines to generate the post-test lifters for the round-robin.
2.3.5.2. Mileti, Coker and Buscher will discuss this possibility and then report back to the sub-group.

2.3.6. Forward Action Plan:

2.3.6.1. Mileti would like to prioritize this action item because it will take the most time to complete.
2.3.6.1.1. It will be the focus of the next sub-group meeting.
2.3.6.1.2. Representatives from the Statistics Group will be invited to attend.

2.4. Use Keyence to Screen Lifters for Profile Quality:

2.4.1. Explanation from Lubrizol:

2.4.1.1. Toyota commented on this issue during a recent sub-group meeting.
2.4.1.1.1. A lifter will rotate if its profile is crowned or flat.
2.4.1.1.2. A lifter will not rotate if its profile is concave.

2.4.1.2. As a result, the Keyence will need to eliminate any lifter that has a concave profile.
2.4.1.3. The Surveillance Panel has changed its position several times within the last year regarding how strict the rejection criteria should be.

2.4.2. High-Spots:

2.4.2.1. The group discussed how high-spots, or unusual peaks, in pre-test lifter profiles should be handled.
2.4.2.2. Some high-spots are due to an anomaly that occurs during imaging.
2.4.2.2.1. These high-spots can be eliminated by re-measuring the part.
2.4.2.3. Other high-spots are physical peaks in the surface of the lifter.
2.4.2.3.1. Most labs will reject lifters that exhibit these irregularities.

2.4.3. Forward Action Plan:

2.4.3.1. Most of the labs already use their own method to screen lifters.
2.4.3.2. Each lab has been asked to document their current method in an email to the entire sub-group.
2.4.3.2.1. Mileti will then summarize all this feedback so that it can be reviewed in a future sub-group meeting.
2.4.3.3. Each lab has also been asked to provide images that illustrate what they consider to be unacceptable lifter profiles.

2.5. Calibrating/Verifying Keyence Units:

2.5.1. There was a lot of discussion regarding how to verify the performance of a Keyence unit.
2.5.2. Keyence supplies a verification block with each macroscope.
2.5.2.1. This block could be used, although it does not directly represent the measurements taken during a IVB test.
2.5.3. Another option would be for each lab to maintain a dedicated set of lifters that are used exclusively for taking verification measurements.
2.5.4. Mileti will devote an entire sub-group conference call specifically to this topic.

Action Items	Person responsible	Completion Date

Follow-up Notes/Updates	Initials	Date Added
Representatives from each of the (5) Sequence IVB laboratories participated in this conference call.	CHTM	07-02-2018

Attendees	Organization	Contact Information

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