**LSPI Task Force Meeting**

**March 29, 2017**

**Agenda:**

1. Roll Call
2. Review Statistical Analysis of LSPI Precision Matrix and Post Precision Matrix Tests
3. Review LTMS Documents
4. Discussion/Action/Motions

**LSPI Task Force Voting Members**

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| --- | --- | --- | --- |
| **Name** | **Contact Info** | **Company** | **Attend** |
| Felt Mounce  **Voting Member** | Phone: (210) 522-5411  [felt.mounce@swri.org](mailto:felt.mounce@swri.org) | SwRI | Y |
| Greg Miranda  **Voting Member** | Phone: (440) 347-8516  [Greg.Miranda@Lubrizol.com](mailto:Greg.Miranda@Lubrizol.com) | Lubrizol | Y |
| Adrian Alfonso **Voting Member** | Phone: (210) 838-0431  [Adrian.Alfonso@Intertek.com](mailto:Adrian.Alfonso@intertek.com) | Intertek | Y |
| Amol Savant  **Voting Member** | [acsavant@valvoline.com](mailto:acsavant@valvoline.com) | Valvoline | Y |
| **Voting Member** | Phone: | Afton |  |
| Robert Stockwell  **Voting Member** | Phone: (210) 232-3188  [Robert.stockwell@chevron.com](mailto:Robert.stockwell@chevron.com) | Chevron Oronite | Y |
| **Voting Member** | Phone: | ExxonMobil |  |
| Gordon Farnsworth  **Voting Member** | Phone: (215) 491-1216  [gordon.farnsworth@infineum.com](mailto:gordon.farnsworth@infineum.com) | Infineum | Y |
| Jeff Hsu  **Voting Member** | Phone: (281) 544-8619  [j.hsu@shell.com](mailto:j.hsu@shell.com) | Shell | N |
| **Voting Member** | Phone: | BP |  |
| Ron Romano  **Voting Member** | Phone: (313) 845-4068  [rromano@ford.com](mailto:rromano@ford.com) | Ford | Y |
| **Voting Member** | Phone: | General Motors |  |
| Teri Kowalski  **Voting Member** | Phone: (734) 995-4032  [Teri.Kowalski@tema.toyota.com](mailto:Teri.Kowalski@tema.toyota.com) | Toyota | N |
| Haiying Tang  **Voting Member** | Phone: (248) 512-0593  [HT146@Chrysler.com](mailto:HT146@Chrysler.com) | Chrysler | Y |
| Rich Grundza  **Voting Member** | Phone: (412) 365-1034  [reg@astmtmc.cmu.edu](mailto:reg@astmtmc.cmu.edu) | TMC | Y |
| Dan Lanctot  **Voting Member** | Phone: (210) 690-1958  [dlanctot@tei-net.com](mailto:dlanctot@tei-net.com) | TEI | Y |
| Jason Bowden  **Voting Member** | Phone: (440) 354-7007  [jhbowden@ohtech.com](mailto:jhbowden@ohtech.com) | OHT | Y |
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Meeting Attendance

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| **Attendee** | **Company** |
| Ed Altman | Afton |
| Rich Grundza | ASTMTMC |
| Preston Tarry | BP |
| Ricardo Affinito | Chevron |
| Jo Martinez | Chevron |
| Robert Stockwell | Chevron |
| Ron Romano | Ford |
| Doyle Boese | Infineum |
| Gordon Fanrsworth | Infineum |
| Al Lopez | Intertek |
| Jason Soto | Intertek |
| Martin Chadwick | Intertek |
| Greg Miranda | Lubrizol |
| Joseph Gleason | Lubrizol |
| Kevin O'Malley | Lubrizol |
| Jason Bowden | OHT |
| Matthew Bowden | OHT |
| Felt Mounce | SwRI |
| Cole Hudson | SwRI |
| Travis Kostan | SwRI |
| Dan Lanctot | TEI |
| Nate Bean | Valvoline |
| Chris Taylor | VP Racing Fuels |

Presentation:

LSPI Precision Matrix + Non-PM Data Analysis

Presented By: Travis Kostan, Southwest Research Institute



Presentation:

LSPI LTMS Summary

Presented By: Martin Chadwick, Intertek Automotive Research

1. Report Average LSPI Events to two decimal places to avoid bias due to rounding and reduce potential errors.
2. Adopt the transform (AVPIE+0.5)0.5 for LTMS and severity adjustment calculations.
3. References will be conducted on RO 221 (50%) and 222 (50%) only.
4. Reference Oil targets
   1. 221 Mean = 3.3819, s = 0.3609
   2. 222 Mean = 4.2644, s = 0.2694
   3. Severity adjustment s = 0.2856
5. Each stand-engine combination will be charted independently for determination of reference acceptance and severity adjustments.
6. Utilize limits on Zi (EWMA of severity), ei (prediction error), and the excessive influence calculation to determine acceptance and calculate severity adjustments (similar to IIIH, COAT, and T13).
   1. Zi Lambda = 0.4
   2. Z0 = Average of tests required to achieve initial calibration
   3. Zi Limit 1 = 0.000; continuous severity adjustments are applied
   4. Zi Limit 2 = +1.800/-1.800; a stand-engine that exceeds these limits requires additional references until it is within the limits.
   5. R = 1.000; R is an ei inflation factor to account for differences in the repeatability and reproducibility standard deviation; Zi limits are in terms of reproducibility (performance across all expected stand-engine combinations) and ei limits are in terms of repeatability (performance in a single stand-engine combination). R in this case is 1.000 as lab, stand, and engine are not significant in the model at this time.
   6. ei Limit 1 = +/-1.000; this limit applies to a new stand-engine combination when judging the acceptance of the second reference only.
   7. ei Limit 2 = +/-1.351; this limit applies to a previously calibrated stand-engine that has not been calibrated for two reference periods and is attempting to calibrate again. The engine can calibrate with one test if the Level 1 limits are not exceeded. Otherwise, immediately conduct another reference test in the stand-engine and utilize Level 4 limits for successive tests.
   8. ei Limit 3 = +/-1.734; this limit applies in situations pre-determined by the SP to have potential impact to stand-engine severity. Some situations that may warrant consideration include replacing a head or turbo on a currently calibrated stand-engine (depending on how engines are defined). The engine can calibrate with one test if the Level 2 limits are not exceeded. Otherwise, immediately conduct another reference test in the engine-stand and utilize Level 4 limits for successive tests.
   9. ei Limit 4 = +/-2.066; this limit applies to all other situations when determining an acceptable reference. If the limit is exceeded do not update control charts until after an additional reference is conducted and apply excessive influence calculations.
   10. The excessive influence calculation minimizes the impact of a failing reference test if the following reference test does not agree with the initial failing results and returns to historical severity performance (LTMS 1.A.5).
7. A minimum of two references will be required for each new stand-engine combination. The second reference will be judged against Zi Limit 2 and ei Limit 1 to determine the need for another reference. Additional references will be judged against Zi Limit 2 and ei Limit 4 to determine the need for another reference.
8. The reference calibration period will expire after five valid candidate tests, xxx engine hours, or 90 days, whichever comes first.
9. The TMC will plot industry Zi charts to identify potential shifts in industry wide performance.
   1. Lambda = 0.2
   2. Z0 = 0.000
   3. Zi Limit 1 = +/-0.775
      1. When industry level one limits are exceeded the TMC investigates whether severity adjustments are adequately addressing the trend, investigates the possible causes, and communicates as appropriate with industry.
   4. Zi Limit 1 = +/-0.859
      1. When industry level two limits are exceeded the TMC informs the surveillance panel that the limit has been exceeded. The surveillance panel then investigates and pursues resolution of the alarm.

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**Discussions**

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| Discussion 1 | Since TMC 220 is closest to the pass/fail limits, how do we incorporate it into the reference procedure? |
| Discussion 2 | Do the new pistons match the old pistons? If no, should we consider using the stock pistons that come with new engines instead of these new pistons? |
| Discussion 3 | Ask if anyone wants to produce a borderline passing oil for referencing. |
| Discussion 4 | What is the referencing period, and how do we incorporate hours. |

**Actions**

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| Action 1:: | LSPI development team will meet to discuss if and how to use TMC 220 in the reference procedure. |
| Action 2 | Participating labs to inspect new receipt of piston to make sure they match the original design. |

**Motions**

No Motions were made.

**Next Meeting**

LSPI Task Force meeting to approve LTMS scheduled for April 7, 2017, 9:00 AM to 1:00 PM EDT

Location: WebEx Teleconference