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| Cc: | Kostan, Travis G. (travis.kostan@swri.org) |
| Subject: | Mack Surveillance Panel Meeting Minutes - August 1, 2016 |
| Date: | Monday, August 01, 2016 12:29:35 PM |

Everyone,

The following are the unconfirmed minutes of the Mack Surveillance Panel Meeting held on August 1, 2016. The meeting was conducted by WebEx. Please feel free to let me know if there are any changes or revisions needed. Thanks.

Call Participants:

Afton - Christian Porter ExxonMobil – Cliff Salvesen Infineum - Bob Salgueiro (Secretary), Elisa Santos Intertek - Jim Moritz, Luiz Garcia, Juan Vega Lubrizol - Jim Matasic, Nick Secue, Jon Ahlborn, Kevin O'Malley Oronite - Mark Cooper (Chairman), Jim Rutherford SwRI – Jim McCord, Robert Warden TEI - Mark Sutherland TMC - Sean Moyer Volvo/Mack - Greg Shank

Mack Surveillance Panel Meeting

The Mack Surveillance Panel meeting was called to order at 10:30 AM Eastern, by Mark Cooper, Chairman of the Surveillance Panel. The agenda topics are listed below, with discussions and actions following.

Agenda Topics:

• Update from Humidity Task Force

Nick Secue (Lubrizol) gave the update. All labs discussed how they are measuring humidity and labs feel their capabilities and equipment are adequate. Bob Warden (SwRI) sent out the equation to be used for calculating humidity to the labs. Labs are measuring humidity and will

compare data to determine if there is a need to measure at different location. Next meeting will be scheduled in week or two after data is shared between labs.

 Coordinated references for new T-11 / T-12 new ring batch and labs to provide feedback on when they expect to convert to W batch rings and when next references are due

Afton has 4 sets of U-rings and 2 T-11 kits with the same U rings. SwRI expect to be out of U-rings early/mid Sept. Lubrizol will need to reference by end of the year. Afton will be out of parts before they need to reference. Surveillance Panel agreed to run coordinated references. Extended reference periods are in place at most labs due to coordinated reference for bearing introduction a few months ago. Piston ring pedigree is the same but the rings now have a Volvo part number instead of a Mack number and must be purchased in sets (top, 2nd, oil control). TEI will make a clean break and go to these new ring sets. TEI has the new rings in hand. Labs will work with TMC to coordinate references. Surveillance panel can motion to break up extension periods for labs and TMC can work with each lab on how best to implement.

MOTION: Bob Warden motioned and Christina Porter seconded, that the Surveillance panel allows TMC to alter reference periods for the T-12 as necessary to run coordinated references. Voting: Unanimously Affirmative, no opposed, no waives Motion Carried.

The Labs coordinated their references and agreed to start by Sept 1st.

MOTION: Bob Warden motioned and Jim Moritz seconded for acceptance of the introduction of the new ring batch "W" into the T-11 as a rolling change. Voting: Unanimously Affirmative, no opposed, no waives Motion Carried.

Surveillance Panel agreed that test stands may run old hardware to use up inventories after referencing with the new batch of rings. Labs need to inform TMC of the number of candidates while the stand is in pending status. LTMS will be calculated from the date that the Surveillance Panel accepts the new batch of rings.

The "W" batch of rings should last about 2 years, the current main bearing batch should last 2.5 years, the current connecting rod bearing batch should last 6 months (but TEI needs to verify could be a part number change affecting their estimate), liners should last 2 years according to TEI.

ACTION: TEI will send out an update after confirming the actual inventory of connecting rod bearings.

Labs noted that from time to time they are still seeing issues with coolant leaking, and shimming hasn't helped the issue. Volvo was looking into the manufacture of the head gasket.

ACTION: Christian Porter (Afton) has received the head gasket prints from Volvo and will distribute them to the rest of the Surveillance Panel.

Christian found an old set of T-8 head gaskets and the fire rings are similar material and hardness to the current T-12 gaskets but Christian is investigating if the T-12 gaskets might be close to the higher end of the thickness spec, and postulated it may be preventing the fire rings from being fully compressed.

ACTION: Christian will update the Surveillance Panel on his findings.

• Review of T-13 references with controlled humidity

Jim Rutherford (Oronite) performed an analysis of the LTMS database. There are 6 valid humidity controlled references. LTMS severity adjustments are currently still including prior references which did not humidity controlled. There was concern that maybe all labs were seeing a significant shift in severity. Options were discussed on possible actions to take. The Surveillance Panel could reset LTMS after labs complete 2 valid references on humidity control but not all labs have 2 valid references for humidity control. Afton has always been on humidity control since they share air with their PCMO tests which require it. Volvo suggested possibly using the prior Afton data since it was on humidity control but the prior oil run was not on the reference oil. Doing an analysis of effect of humidity control will depend on where lab's humidity was before the implementation of humidity control which could be guite widely spread. Another suggestion was to let LTMS update itself as more data comes in. One lab triggered a level 3 alarm (Lab F) likely due to their last result was not humidity controlled and was run during a period of relatively low humidity. They could run another reference which would cap the excessive influence of the last reference.

Lubrizol posed philosophically whether this could have been considered against level 2 alarm but that would have had to been declared before the results are generated. The Surveillance Panel could consider this for future references where new hardware or operational changes are implemented. The question was raised whether data run before humidity control affect the Labs LTMS? The Lambda could be shortened on a temporary basis for the labs to more heavily weight the humidity controlled reference data and could move the lambda back after labs get caught up. Alternatively the panel could just let the LTMS work itself out since it does not look like many of the labs shifted all that much.

Lab F had a concern that other labs may be experiencing the significant shift they did with the switch to humidity control, but after reviewing the LTMS data most labs were not significantly affected.

Surveillance Panel agreed to wait until we get more reference data and let LTMS continue to adjust with more data and the industry statisticians were all in concurrence.

• Renaming IR in response to resolution of negative for T-13 Subcommittee B ballot

Discussed changing FTIR Peak Oxidation parameter in the T-13 to "T-13 FTIR Peak Oxidation" to address the negative from the Sub B ballot.

Greg Shank Motioned, Jim Moritz seconded to change the name of the FTIR Peak Oxidation test parameter in the T-13 test, to "T-13 FTIR Peak Oxidation".

Voting: Unanimously Affirmative, no opposed, no waives Motion Carried.

TMC will go through and update the test method, data dictionary and report forms.

• Resolution of outdated references in Annex A3 in T-8 test method and other Mack test methods

Mark Cooper (Oronite) will put together a list of all those and the SP can review each.

Old/New Business

- Jim Moritz (Intertek) T-8 has been experiencing mild results and would like to discuss for next meeting. SwRI agreed they had a similar observation. TMC confirmed that TMC 1005-5 had same pedigree as TMC 1005-4.
- Luiz Garcia (Intertek) suggested we review test methods on some recurring interval, rather than being reactive and only acting when we encounter out of date references in Mack procedures.

Other Business

• None

Next Meeting

• Tuesday Aug 30th, 2016 from 10:30 AM Eastern

The Mack Surveillance Panel adjourned at 12:06 PM Eastern.

Respectfully submitted, **Bob Salgueiro** Industry Liaison Advisor Infineum USA L.P. 1900 East Linden Avenue Linden NJ 07036 USA Office: 908-474-2492 Fax: 908-474-3637 Mobile: 908-358-8742 E-mail: <u>Bob.Salgueiro@Infineum.com</u> Please consider the environment before printing this e-mail. This note and any attachments may contain Infineum confidential or proprietary information. If you are an unintended recipient: (i) place no reliance on the information contained herein; (ii) do not disclose, distribute, or duplicate any information from this note; and (iii) please contact the sender.

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