

## IIH Task Force Conference Call February 16 2015

### Attendees:

Chrysler: Haiying Tang, Jeff Betz

Intertek: Adison Schweitzer, Charlie Leverett

Lubrizol: George Szappanos, Michael Conrad, Kevin OMalley

Afton: Ed Altman

SwRI: Karin Haumann, Sid Clark, Pat Lang, Mike Lochte

Ashland: Amol Savant

OHT: Jason Bowden, Matt Bowden

TMC: Rich Grundza

Infineum: Mike McMillan, Gordon Farnsworth

Ford: Ron Romano

Halterman: Tracey King

Karin reviewed the agenda items for the group

- Hardware availability for first reference period
- Additional data on TMC 438
- Resolve inter lab variability
- Review of hours to PVIS to reduce variability
- Oil temperature control setpoint

### Hardware availability:

Karin discussed the actual hardware available to the group for Matrix testing including the current inventory at the test laboratories and hardware at OHT. Karin reiterated the need to start the Matrix using these materials to get the data now so Chrysler can plan the engine build.

Amol asked where the dates come from and Charlie Leverett commented that he felt some of the parties have actually held off from signing the MOA due to concerns about hardware availability to support the first reference period after completing of the precision matrix.

Rich asked what the timeline was for Chrysler and Jeff commented he needed to run the engines in June / July of 2015 and needed to work with the packaging / preservation and storage facility to have everything arrange for the build a month before the actual engine run.

Ron Romano indicated this meant we need to make the commitment to Chrysler in the May time frame. This actually means the AOAP just needs to indicate we are going to use the test in the category. Jason questioned the fact that there would be a waiting period between matrix completion and final acceptance of the test into the category and that will take a considerable amount of time.

Jeff Betz reiterated Chrysler is looking for a commitment the test will be in the category.

Ron asked supporting comment from the group referring to past experiences that once a test enters into matrix testing it generally is included in the category. Pat Lang commented on the Sequence IIF as an example where the test was actually re-developed to increase severity after the original precision matrix, understanding the point here is it was not precluded from the category just because the users felt it needed to be modified after the matrix.

Tracey questioned the demonstration period and the group discussed this period indicating the test is actually in after the matrix and the ADCO's use the demonstration period to test and adjust their technologies. This period is not part of the matrix approval.

After much discussion from many members, Ron Romano indicated this discussion is focused on hardware usage to start the matrix using the current hardware available not when the final data from the matrix would be analyzed.

Karin returned to hardware availability and how many sets of hardware were out at the labs and what is available at OHT. The group discussed how much material is available and how many tests would be available for the first reference period run on the same matrix materials. Ed Altman indicated if the Task Force agreed to a shorter reference period, the AOAP will not disagree, they will accept the decision from this group.

Ed suggested the group discuss whether the labs would accept a shorter reference period on the matrix hardware indicating the first reference period would be shortened to meet the hardware available which would mean ~ 5 tests / stand for the first period.

The group discussed the pending testing requirements on Reference Oil 438 to satisfy the questions raised at the AOAP meeting. Karin responded she felt those tests could be part of the precision matrix if the run order was changed to run the 438 tests first. Charlie questioned the statisticians run order as planned and Karin reminded everyone that the original test order was designed to address concerns about additive carry over between tests, however, the IIIH test uses new engines for each test and therefore the order could be rearranged to whatever order needed to include the 438 testing first.

The group discussed this and Ron Romano suggested the group would run two 438 tests first and ILSAC would look at the data and decide whether the data looked appropriate and if so, ILSAC would recommend they be considered acceptable for inclusion in the matrix. SwRI and Intertek agreed to start these tests using hardware currently in-house.

Karin and Addison agreed to report their inventory levels to the group ASAP.

Charlie commented we all seem to be in agreement we can start the matrix with the hardware currently on hand and inform the AOAP we are willing to shorten the first reference period and re-reference the stands when the new material becomes available, which should be available before completion of the matrix.

Kevin O'Malley from Lubrizol asked Karin about her plans to run the 438 runs first and whether she was asking all labs to run the 438 tests first. Karin indicated her run assignments were to run two 438 tests back to back and she would make those runs first. Kevin suggested there was a specific run order and some of the statisticians might have concerns about running all 438 tests first. Karin agreed she would have to discuss this with the statisticians before rearranging the entire matrix.

The group continued discussion with Karin indicating she would address these questions through the Matrix Design Group.

Rich agreed we have an agreement to reduce the hardware requirement for the matrix and would like to entertain a motion to approve start of the matrix running the 438 tests first. Ed Altman and Amol Savant indicated they would like to have 24 hours to see actual hardware availability before voting on any motion.

Ron Romano reiterated the thought is to run the 438 tests and if they seem to generate the desired severity levels, however Ron agreed that Karin's thought to include this data into the matrix could be an ILSAC recommendation if agreed upon by the statisticians as Karin is proposing.

Ed asked about availability of the tooling fixture to modify the main oil gallery from IMTS. Karin indicated communications with IMTS indicate the fixture should be at SwRI for approval before the end of the week. Karin agreed she could forward the fixture to the other labs as needed to modify blocks for the pending tests until more fixtures become available.

Karin agreed to forward the matrix design to the group. Kevin O'Malley indicated the next statistician meeting was scheduled for January 26<sup>th</sup>.

Karin changed to discussion about lab variability agreeing to send a list to the labs to review and discuss during the next call. She asked everyone to review the list and add areas of concern like: cylinder surface finish requirements, oil consumption differences, temperature overshoot, etc. Addison suggested including inlet air filtration and the group discussed how some labs are using lab filtered air and others still using the production filter element.

The group explained that the inlet air pressure was specified and monitored by a tap in the production inlet air box. Due to the flow rate required, some labs had problems meeting the pressure requirements at the test stand and therefore the production air filter element was allowed to be removed and that lab relied on lab air filtration for the inlet air supply.

Amol asked to include test stand ambient air control and everyone appreciated his concern when the outside ambient temperature is -20° C. Amol suggested possibly using a normally closed / air to open control valve on the oil cooler circuit.

Karin asked all labs to send their concerns to her and she would summarize everything and send the list to everybody.

The group discussed thermocouple insertion depth of the oil pump inlet gallery thermocouple and where labs have been setting it in recent tests focusing on locating the tip of the thermocouple just past the 90° drilled passage into the mid-stream flow of the oil coming from the oil pump. Ed Altman commented for those on the call not familiar with the discussion, this temperature is a record only temperature and is only being discussed to standardize for comparison between the labs when reviewing this temperature, it has no effect on the test.

Karin moved to discussion on reviewing the 434 data looking at Hours to 100 and 150% viscosity increase to look at the variability on 434-1 as a more appropriate way to look at the data. The group commented this should be the method of looking at all the oils if it's going to be used for 434-1, however, REO2 does not make 100 or 150% increase and we can't extrapolate out that far. The group discussed looking at comparison to the Sequence IIIG and possibly reviewing how the Sequence IIIE used a formula comparing hours to a specific % increase that would fit all the reference oils. Karin and Janet will work on this and send the data to the group for further discussion.

The group discussed comments on where the oil temperature thermocouple was being placed in the gallery and possibly looking closer at the control set point looking at sump temperatures and additional statistical parameters. Karin suggested Ed look at the data review any suggestions with the group. Karin suggested the variability in the Afton data may be related to the uncontrolled parameters such as the sump and oil pump inlet thermocouples, suggesting the IMTS Fixture would standardize the location of the control thermocouple.

Karin started review of the action items from today's call and Addison asked to review his outstanding motions.

Jeff commented about re-use of cylinder heads indicating he reviewed post-test materials at SwRI and expressed concerns about valve seat wear on exhaust seats and preferred to use new heads for the matrix and at least the first reference period.

Addison made a motion to allow the use of Chrysler Dealer Parts for valve train hardware to allow pre-build of cylinder heads in advance of tear down of core materials.

Motion Addison Schweitzer / Ed Altman

Passed Unanimously

Addison will send exact wording from his proposal as on his email proposal to Karin.

Next Addison reviewed his data comparing the J-Tek blowby unit to the Sharp-Edge Orifice Meter specified in the IIIG Test Procedure and currently used in IIH Testing. The group discussed operations of the J-Tek and the need to balance the engine crankcase pressure during

blowby measurements. George commented the J-Tek is only in use during blowby measurement by use of the three-way valve installed in the breather system.

Addison made the motion and George seconded the motion.

During discussion Karin asked to table the motion to allow everyone time to review the data before taking a vote on accepting the J-Tek System for measurement for blowby.

The group continued discussion about breather system configurations, the use of Shell coolant and coolant system reservoir pressure control.

Karin agreed to change the procedure to indicate gage pressure as required units for the pressure of the coolant reservoir.

Adjourn 5:46 pm Eastern.

This is a compilation from notes recorded during the call, with comments from member participants during the Draft Review. Certain subjects may not necessarily be in exact order; however, they are believed to represent an accurate account of the call. If anyone feels changes or additional content may be necessary, please contact Sid Clark @ 586-873-1255 or [Sidney.Clark@swri.org](mailto:Sidney.Clark@swri.org)

Thanks, Sid