

Mack T8/T8E Surveillance Panel Call - June 29th 2011

On call:

Z. Bishop - TEI
A. Ritchie/D. Boese/J. Gutzwiller - Infineum
J. Clark - TMC
B. Campbell - Afton
J. Matasic - LZ
M. Cooper/J. Rutherford - Oronite
G. Shank - VolvoMack
B. Carter - IAR
S. Richards- SwRI
R. Conti - ExxonMobil

SP call was convened to discuss the status of the T-8 and T-8E test and review Jim Rutherford's presentation on the reference oil data. Jim considered transformations but found the data did not substantiate a need for a transformation. Jim's analysis included revised targets and Industry Correction Factors and is attached. Doyle Boese reported his own findings using a smaller dataset with different assumptions and commented that it showed a vast difference in potential targets and correction factors. Doyle's analysis covered a shorter period of time - 2007-2008 and just 2 and 3 data points from the 2 calibrated laboratories versus Jim's analysis which assessed 9 and 6 data points over a much longer time period. Doyle felt that if there was a shift it would be better to use a shorter time period but that correction factors with this smaller dataset land on current targets for 1005. His analysis concludes that for all 3 parameters one lab is severe and the other close to target or mild (prior to the recent Lab J results). **Doyle stated that** the lack of robustness of the estimated targets and correction factors relative to the assumptions made is a concern **to him. Jim did not agree with the approach Doyle took with the data.** Jeff Clark commented that 1005 was assessed against the 1004 soot window and the timing is fixed during calibration. The soot window in place for 1005 is very close to 1004 but since both oils handle soot differently they inherently should have different soot windows. Bob Campbell commented that even with 2 oils run back to back the soot levels are different because engines drift. However we should be able to see different soot handling capabilities later in the test to see if oils are handling soot differently and indeed the soot numbers for 1005 are higher than the 1004 levels for every test in the TMC database. When the 1005 soot curve is pulled down to 1004 it is difficult to assess the effect. Bob commented that the engine moves in the same direction. 1004 falls over a little bit while 1005 holds more soot so if the timing isn't changed it will change severity. Mark Cooper questioned whether the engine is sensitive enough to see the timing change in respect to the different reference oils.

The current situation is that of the 2 labs which run the T8/T8E tests, one is only calibrated for the T-8 (not T-8E) and the other will only be calibrated (for both) for a few more weeks. Two recent efforts at each of the San Antonio laboratories to calibrate with the new (T-11) new liner and top ring and fuel failed mild on all 3 key parameters. IAR test had low oil consumption and low soot while SwRI had higher oil consumption but still failed mild on soot handling. ~~Jim Rutherford confirmed that options to introduce correction factors and severity factors cannot be currently supported by the reference oil database.~~ Two labs will each start a calibration test in the next 2 weeks but anticipate the TMC/SP will need to consider applying new correction factors to restore calibration status if the tests come in mild as expected. With 2 additional data points the SP with guidance from the statisticians will need to assess the case for introducing

correction factors as the only viable means of restoring T8/T8E calibration status to one or both of the San Antonio laboratories. A likely outcome when these tests complete without these new correction factors is that there will be no calibrated T8/T8E stands for the foreseeable future. Bob Campbell supported by others suggested that the group may be better served to try to develop a solution based on the T11 rather than invest further time and effort to restoring the T8/T8E tests. ExxonMobil (R.Conti) confirmed that they did look at a T11 option a few years ago but the test broke very severe. Some felt that since the T-11 engine was better controlled - soot window would be easier to control with no engine drift - and with new hardware and fuel it was possible that a more encouraging outcome might emerge this time. SP members agreed to solicit their companies for their possible support for a T11 study and report back at the next call on July 11th. R.Conti agreed to provide the SP with the T11 data generated at the Paulsboro laboratory. One suggestion was to make key measurements at 2.5% soot rather than 3.8% soot since soot input rates probably vary with the reference oil. Reference oil 1005-3 cannot be reblended and is in short supply and once depleted will present further issues with calibrating a T8/T8E test and possibly not be available in sufficient quantities for a T11 development effort.

The discussions on how to resolve the Mack T-8 severity issues will resume on Monday, July 11, 2011, from 2PM - 3PM Eastern. Dial-in number and passcode; 877-344-4239 836691# ExxonMobil will provide the data previously generated that has already been identified in an attempt to correlate the T-11 and T-8 tests. It will be circulated before the teleconference. If anyone has any additional data this data should also be forwarded ahead of the call. SP members should be ready to offer their company's position and support for a possible T-11 study. The 1005-3 inventory will be reviewed and the discussion of future reference oil scenarios to address future T8/T8E calibrations or the needs in the development of a T11 test will resume.