T-13 Teleconference April 9, 2015

Attendees:
Bob Warden (SwRI), Sean Moyer (TMC), Mark Sutherland (TEI), Jose Starling (SwRI), Pat Fetterman (Infineum), Frank Farber (TMC), Elisa Santos (Infineum), Jim Gutzwiller (Infineum), Greg Shank (Volvo), Bob Campbell (Afton), Christian Porter (Afton), Bob Salgueiro (Infineum), Jim Rutherford (Oronite), Luiz Garcia (Intertek), Jim Moritz (Intertek), Mark Cooper (Oronite), Jim Matasic (Lubrizol), Jim McCord (SwRI)

Topics:
1. Charting Options
2. Calibration Period Adjustments

Charting Options

Call was held to discuss how TMC would move forward with industry charts as labs transition from torque controlled to fuel flow controlled tests. An email was sent to the taskforce on April 8th with 3 potential options.

Option 1:

Each lab will have 2 charts; 1 for torque control tests and 1 for fuel flow control tests. The charts will not be separated until there are 2 chartable fuel flow control tests at a lab. The SA for the first fuel flow control test at a lab will be included in the charts for the torque control tests at the lab. When two fuel flow control references are available at the lab, the charts will be separated and calculated normally.

Option 2:

Each lab will have 2 charts; 1 for torque control and 1 for fuel flow control. The charts will be separate and the Z_{0} for the fuel flow charts will be equal to Y_1.

Option 3:

Each lab will have 2 charts; 1 for torque control and 1 for fuel flow control. for the fuel flow chart will be calculated using a percentage of the EWMA of the torque control chart and the Y_1 of the first fuel flow control test. (ie. ~~Z_0~~ $Z_1 = 0.8 * Y_1 + 0.2 * Z_{torque}$). The Z_i for the 2nd and all subsequent fuel flow control tests will be based on fuel flow data only. (ie. $Z_0 = (Y_1 + Y_2)/2$ and $Z_i = 0.2*Y_i + 0.8*Z_{i-1}$ for $i>0$)

To date, only one test has been run on fuel flow control but this means that how the control charts will be handled needs to be identified soon. An additional question was how the original torque controlled data should be handled moving forward once all tests are fuel flow controlled. It was decided that the torque control data should remain in the industry charts until all labs have converted to fuel flow control and then the taskforce can decide if they should be removed.

If we implement Option 2 or 3, labs would need to carry two different SA's until all stands are converted to fuel flow. There was a question as to how candidates that are

currently running when a reference finished would be handled. The SA would be re-calculated with the new reference data and applied to the candidate that finished after the reference test, this is not a change from current practice.

After discussion, Option 3 emerged as a clear preference. For clarity, Option 3 would initially use the results of both the torque controlled and fuel flow controlled heavily weighted for the fuel flow. Upon completion of the second fuel flow controlled reference the Fast Start method would be used. The weighting of the fuel flow control to torque control was discussed. The initial ratio of 80/20 was really just a first guess and did not have a strong reason for choosing. Jim Rutherford pointed out that 75/25 would have more significant figures and it was decided to move forward with the more precise ratio of 75/25.
Jim Moritz made a motion to use Option 3 with a weighting of 75/25 for fuel flow controlled to torque controlled. Vote passed unanimously.

Calibration Period Adjustments

Jim Moritz sent a note to the taskforce pointing out that there is some concern about test availability in the industry in June when most of the matrix stands come due for calibration which would be in the middle of the Tech Demo period. It was asked if we could remove the time limit for referencing in the hope of spreading out the reference tests in the industry. Jim Rutherford pointed out that extending this timeline would increase the amount of the Tech Demo period that is conducted under torque control. It was also asked if changing the time period would actually spread out the referencing or just give an extra few weeks. Taskforce asked Sean Moyer to go back to TMC and see if it would be possible to have labs switch to the fuel flow control by referencing early and getting back some of the tests on the next reference period. Sean agreed to discuss and the taskforce will discuss again on Monday, April 13. Taskforce agreed (but did not vote) on the motion to be:
Taskforce directs TMC to adjust the calibration periods to encourage labs to convert to fuel control, any unused calibration period up to 2 months or 4 tests can be added to the following reference period.

Sean pointed out that reference oil availability is such that it would not be helpful if everyone requested new oil immediately.