

Humidity Task Force Meeting Notes 7/15/16

Participants:

-Cliff Salvesen -Sean Moyer -Nick Secue -James Gutzwiller -Luiz Garcia -Mark Cooper -Bob Campbell
-Bob Warden -Christian Porter

- Short Term Details
 - Task force determined current humidity control method is satisfactory until more data can be captured
 - Location to measure dew point temperature and pressure does not matter before or after intake air restriction valve. Just has to be after conditioning and steam injection.
 - Task force agreed on using calculation highlighted below and will need to update into procedure once best humidity control practice is determined.

$D = \text{Measured Dew Point, Degree C}$

$P_a = \text{Measured Pressure of Air, Pa Absolute}$

$P_w = \text{Calculated Partial Pressure of Water, Pa Absolute}$

$W = \text{Calculated Humidity, g/kg}$

$$P_w = 100 * 10^{23.5518 + \frac{-2937.4}{D+273}} * (D + 273)^{-4.9283}$$

$$W = 621.98 * \frac{P_w}{P_a - P_w}$$

- All labs are currently measuring all parameters that will be included in the new test report and controlling to a +/- 1.0 QI
 - Parameters included in new test report:
 - Dew point Temperature (°C)
 - Dew Point Pressure (kPa)
 - Moisture Content (g/kg)
- Humidity Sensing Equipment
 - Quick review by the task force of current humidity sensing equipment determined all equipment is in acceptable accuracy range of each other
 - No concern on equipment causing testing variability
- Best Way to Measure Humidity
 - Task force agreed to complete a series of readings to determine if humidity needs to be controlled at the engine not at engine intake due to different intercooler designs
 - A dew point temperature will be reported for the intercooler out and intake manifold by either using a humidity sensing device which can withstand the environment within boost air flow or pulling a 2 cfm flow sample and analyzing.

- Labs will report findings at the next task force meeting which will be in 2-3 weeks
 - This experiment is to confirm there are no humidity differences in the engine from lab to lab
- Side Notes
 - Due to humidity causing a slight shift in references noted by Exon the subject of investigating LTMS date will be brought up to the surveillance panel at the next meeting