Verification of Airliner Fuel Tank Inerting

Verification of airliner fuel tank inerting is achieved by sampling the ullage vapor at 24 points in center and wing tanks during the flight profile and measuring the oxygen concentration in the aircraft cabin using 6 tunable diode laser analyzers with 4-point multiplexers. The sample transport time of about 50 seconds is maintained constant providing data correction to real time. The response time of the analyzers is 1 s, so a complete data set may be collected every 5 s. Pressure correction of the oxygen absorption provides measurement accuracy from 5 to 21% oxygen and from sea level to 45,000' altitude. Data integrity confidence is enhanced by built-in autocalibration and check gas measurements. Hazards of measuring the fuel/air mixture are mitigated by sampling-point float valves, flow impedance sensing for liquids, automated backflush, liquids filters, low-temperature optical absorbance measurement, monitored analyzer enclosure inerting, and enclosure leak sensing.

Bruce W. McCaul, Ph.D.
Oxigraf, Inc.
1170 Terra Bella Ave
Mountain View, CA 94043

650 237 0155 x221
brucem@oxigraf.com