Technical and Sociological Aspects of Qualifying Future Alternative Fuels in Aircraft

George Wilson
Sr. Research Scientist, SwRI
Vice Chair for Emerging Fuels, ASTM Aviation Fuel Subcommittee
ENGINEERS!
An Issue of Scale

◆ Every Minute of Every Day 30% of the US Fuel Supply is on the Pipeline Between Houston and New York
◆ A Typical Batch of Jet Fuel is 100,000 bbl
  – 4.2 MM Gallons
  – 15.9 ML
  – $12+ Million Dollars
◆ A Potential Contamination of the Fuel Supply Threatened to Close Dulles for Two Weeks
◆ Bad Fuel Threatened to Shut Miami International which Only has a Two Day Supply
IS <> NOT IS

- The Logic of Specifications
  - Tests Sufficient to prove “IS” – The Box
  - Alternate Fuels may not fit – The Box
- Basic Logic has Worked for 50 Years
  - Lufthansa Fuel Control
    » 3000 hr Hysteresis Problem
    » Brazil Slow to Upgrade Thermal Stability
  - New Zealand Lubricity Problem
    » 10 incidents on 10 planes
    » Guidance on Severe Hydrotreating
    » OEMs Moved to Improve Pumps

- Now…
Fuel Icing Blamed

- Yesterday
  - Ice from water in fuel blamed
  - Fuel Problem?
  - Operation Problem?

- What Do We Do?
So Going Back to – The Box

◆ The Difference In Our Interests
  – You Want to Know What’s In the Box
  – We Want to Know the Limits to the Box

◆ So What I Take Away Is
  – TSI Might Improve Our Box
  – DCN Might Change Our Box
  – Aromatics Research Could Direct Qualification for Our Box
  – Modeling Could Answer the Minimum We Need in Our Box
Defending Our Box

◆ There is only ONE Jet Fuel
  – The System does not, and will not, support multiple fuels
  – No opportunity for J85 or BioJet (in the FAME sense)
  – Any Alternative Must Be Drop-In Compatible

◆ You Help In Defining the Limits is Critical
  – I Welcome Your Input to the Emerging Fuel Section to this End
Come to Tampa

- ASTM Aviation Fuel Subcommittee
- Dec. 7-11
- Open Meeting
Aviation in itself is not inherently dangerous. But to an even greater degree than the sea, it is terribly unforgiving of any carelessness, incapacity or neglect.