

Unleaded Replacement Avgas

Background

The current piston-engine powered fleet of general aviation aircraft rely on lead-containing aviation gasoline (avgas) called 100LL to meet the performance demands necessary for safe operation. However, increasing environmental pressure and a shrinking market demand have raised concerns regarding the continued availability of this fuel.

EPA has been sued by an environmental group to evaluate whether lead emissions from the use of leaded fuel in piston-engine aircraft endanger public health or welfare. EPA is currently conducting this evaluation.

The global supply of the lead additive is now satisfied by only one manufacturer, and the low and

shrinking volume of 100LL consumption does not support upgrading of the aging distribution and supply infrastructure that is unique to the leaded avgas market.

Extensive research efforts to date have not found a “drop-in” unleaded replacement fuel—i.e. an avgas without lead that meets all the properties and performance characteristics of 100LL necessary for safe operation of the current fleet of aircraft.

The resulting uncertainty of these factors regarding the future availability of 100LL has stalled aircraft development, sales and modifications and slowed the growth of the GA industry.

In response to this environment, the FAA formed the unleaded avgas

transition aviation rulemaking committee (UAT ARC) to collaborate with industry to investigate the current issues relating to the transition to an unleaded fuel, and recommend the tasks necessary to investigate and resolve these issues. The final report was issued in February, 2012 and the FAA is currently implementing the UAT ARC’s recommendations.

The FAA established the Fuels Program Office in 2012 to implement the UAT ARC recommendations and has formed the Piston Aviation Fuel Initiative (PAFI) Steering Group (PSG) with industry to oversee the transition to an unleaded avgas. The FAA has budgeted R&D funding to support testing of candidate fuels at the FAA Technical Center.

UAT ARC Key Issues

- An unleaded replacement fuel that meets the needs of the entire fleet does not currently exist.
- No program exists that can coordinate and facilitate the fleet-wide evaluation, certification, deployment, and impact of a replacement AVGAS.
- No market driven reason exists to move to a replacement fuel due to the limited size of the AVGAS market, diminishing demand, specialty nature of AVGAS, safety, liability, and the investment expense involved in a comprehensive approval and deployment process.
- No FAA policy or test procedures exist to enable fleet-wide assessment and certification of a replacement unleaded fuel.

UAT ARC Key Recommendations

1. Implement a fuel development roadmap for avgas readiness levels that identifies milestones in the aviation gasoline development process.
2. Establish centralized testing of candidate unleaded fuels which would generate standardized qualification and certification data.
3. Establish a solicitation and selection process for candidate unleaded aviation gasolines for the centralized testing program.
4. Establish a centralized FAA certification office to support unleaded aviation gasoline projects.
5. Establish a collaborative industry- government initiative called the Piston Aviation Fuels Initiative (PAFI) to implement the UAT ARC recommendations to facilitate the development and deployment of an unleaded avgas with the least impact on the existing piston-engine aircraft fleet. To learn more, visit www.faa.gov/regulations_policies/rulemaking/committees/documents/

FAA Unleaded Fuel Test Program

In response to the UAT ARC recommendations, and section 910 of the FAA Modernization and Reform Act of 2012, the FAA is establishing a test program at the FAA Technical Center in Atlantic City, NJ.

The FAA will screen candidate fuels and select the best performing fuels in a two phase program. The program will include a comprehensive portfolio of laboratory,

rig, engine and aircraft fuel testing intended to characterize the compatibility of the candidate fuels with the requirements of the current fleet of piston-engine powered aircraft.

The test program will provide data to support both industry and FAA approval of two candidate unleaded fuels.

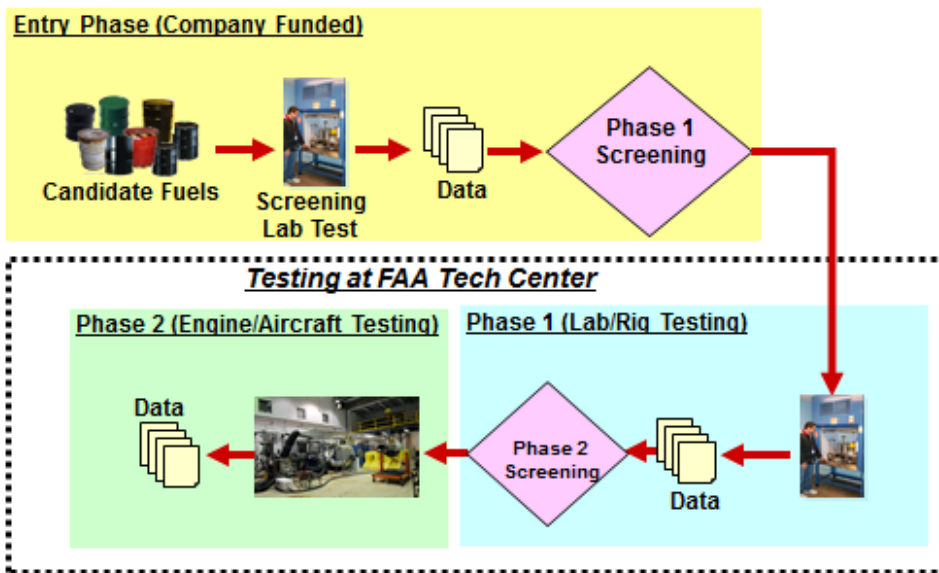
In June, 2013, the FAA issued a solicitation requesting candidate unleaded fuels for testing.

EPA/FAA Collaboration

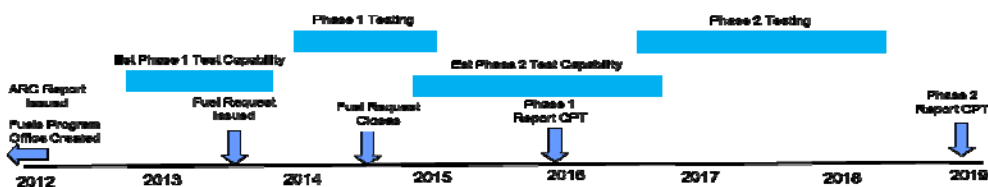
The Clean Air Act established statutory responsibilities of the EPA and FAA as related to control of aircraft emissions. A positive endangerment finding by the EPA regarding the impact of lead emissions from piston engine powered aircraft on public health and welfare would trigger a sequence of actions directed towards the regulation of lead emissions.

If EPA makes a positive endangerment finding, the agency would initiate rule-making to consider standards concerning lead emissions from piston-engine aircraft. EPA and FAA must work in consultation so that necessary and appropriate considerations are given to safety, noise, costs, and the ability and time needed to implement new technology. When the EPA issues emission standards, then the FAA must issue regulatory standards for the affected aviation products.

The EPA participated in the UAT ARC to develop and define the PAFI concept and we are continuing to work together to support the introduction of an unleaded replacement fuel.



Schedule



Phase 1 Testing is laboratory and rig testing to evaluate Fit for Purpose properties
Phase 1 testing will be used to select fuels to progress into Phase 2

Phase 2 Testing is engine and aircraft testing
Phase 2 testing will be used for obtaining ASTM Production Specification and for FAA approval to operate on the transport fleet of aircraft

The FAA's Unleaded Fuel Test Program and Schedule

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