



Malibu-Mirage Owners & Pilots Association

2048 Mercer Road, Lexington, KY 40511 • Phone/Text: 859-351-5429 • jsisk@mmopa.com

June 23, 2011 (revised July 18, 2011)

Member Type Club Representatives
Clean 100-Octane Coalition

Re: The Necessity for a Parallel Track Toward an Unleaded Avgas Solution

For more than two decades, many smart, dedicated people in the General Aviation industry have been working towards finding a way to eliminate the tetraethyl lead (TEL) additive in aviation gasoline. The bulk of that effort has been spent toward the goal of finding an unleaded avgas that could be easily approved by its compliance with the current ASTM specification for 100LL avgas, ASTM D910. Many fuel blends have been tested by industry and government regulators, but none compatible with the existing 100LL specification has demonstrated comparable or adequate performance. More recent research has necessarily expanded beyond D910 compatibility and has yielded some promising fuel candidates. But even if they demonstrate adequate performance, properties, and cost, the path to a mass certification cannot be achieved by D910 compliance, and therefore is now much more complicated and uncertain.

In January 2011, the FAA Administrator, in response to requests from general aviation stakeholders, chartered the Unleaded Avgas Transition Aviation Rulemaking Committee (UAT-ARC, or just ARC). For the first time, the FAA has assembled representatives from all major constituent groups to explore and recommend the issues, tasks, and tools necessary to implement a fleet-wide transition to an unleaded aviation gasoline. The FAA's desire to collaborate with GA stakeholders in advance of creating policy and guidance on such a complex issue is appreciated and to be commended. I am honored to serve on the ARC, representing the Clean 100-Octane Coalition of type clubs for owner/pilots of high performance piston engine aircraft. These are aircraft that cannot operate on a fuel of lesser performance capability than the current 100LL avgas. Collectively they consume about a 2/3 market share of the avgas sold in the US.

The ARC and some follow-on entity that will likely implement the ARC's recommendations are by their nature deliberative and slow, being constrained by the necessary consideration of every possible variable in an incredibly complex process matrix – an elaborate project management effort. That process will take many years to fully execute, and must anticipate all foreseeable adverse outcomes, whether they materialize or not. It also requires coordination and cooperation of many diverse, and even competing, interests. In my service on the ARC, I have been encouraged by the professionalism, goodwill and objectivity shown by my fellow participants as we explore a reasonable path toward this transition. I have developed great respect for their depth

of specialized knowledge in their respective fields, and their willingness to share that among the other members. I have seen many creative ideas have come forth and be immediately recognized and coalesced around.

Despite my belief in the need for the ARC process, I do not feel that the ARC alone is the most expeditious path toward our ultimate goal. It can be complimented and improved by another legitimate, existing method for certifying an unleaded fuel for use in certified aircraft – approval by Supplemental Type Certificate (STC). This process offers compelling advantages in some respects when compared to the ARC effort, with very different trade-offs. Unfortunately, within the GA community, many people are passionately and exclusively committed to one method or the other. My argument is that these two methods need not be mutually exclusive, but should actually be complimentary. Pursued as two parallel tracks toward the same destination, it is likely that the GA community will achieve its goal of deploying a full-performance, fungible, affordable replacement for 100LL in a shorter period of time than by either of these approaches in isolation.

To aid in the consideration of this proposition, I have organized the issues and arguments into the table below:

Issues	Possible Certification Methods	
	Supplemental Type Certificate	UAT-ARC and Subsequent Government-Industry Collaboration
Scope of Approval	Suitable for, limited to specific range of engines/aircraft types. Has been used for large-scale approvals, such as auto gas. For multiple engine approvals, the test engine should be a “worst case” example of the general class to be approved.	Goal is entire GA piston fleet, every aircraft-engine combination that currently specifies 100LL as a fuel limitation – including warbirds, trainers, basic, high performance, turbocharged, and pressurized aircraft.
Certification Basis	FAA FAR compliance 14 CFR Sect 33 (engine) and 14 CFR Sect 23 (airframe).	No current basis for mass certification other than compatibility with existing ASTM D910 spec for 100LL, which is not an option. Lycoming accomplished large-scale approvals by Service Instruction No. 1070Q, authorizing use of Hjelmco AVCAS 91/96UL in some series engines. This may be useful precedent.
FAA Guidance	Advisory Circular 20-24B has been used in the past and remains valid, but some in the FAA consider it inadequate.	No guidance exists. Needs to be established, but will likely be compiled from future experience and knowledge gained, hopefully, not prior to.
FAA Support	Very limited progress through early May 2011. Reports lately indicate improvement and progress.	Excellent. Sponsoring UAT-ARC and actively engaged and promoting a collaborative process. Listening and cooperating with industry.

Fuel Specification Development	Can be modeled after existing ASTM D910 100LL spec. Written by the STC applicant, subject to acceptance by FAA, must be adequate to define the fuel sufficiently to achieve conformity for testing. Trade secrets and IP well protected during the development and testing phase.	Modeled after D910, submitted to and approved by industry-government consensus standards setting group, almost certainly ASTM. Lengthy procedure, subject to opposing political agendas. Poor protection for IP if not legally perfected prior to seeking ASTM approval.
Necessity of FAA Tech Center (engine testing facility) for certification process.	Not necessary. STC applicant conducts testing pursuant to a test plan approved by the FAA. Not clear whether testing accomplished by the FAA can be used for "credit" for STC certification efforts.	FAA Tech Center is likely to have a central role in testing for a fleet wide, consensus-based certification effort. Tech Center is currently not adequately funded or staffed for this effort. Also requires agreement among several parties on acceptable test methods.
Financial Risk	Borne almost entirely by STC applicant. Additional resources required by FAA very limited. If STC effort fails, GA still benefits from knowledge gained. If STC succeeds, many answers toward a fleet-wide are gained quickly at no expense to tax payers and schedule shortened.	Borne by taxpayers (considerable additional FAA funding) and by private industry and associations. Requires Congressional approval for funding.
Intellectual Property (IP)	STC process has historically demonstrated adequate protection for IP. Important consideration to encourage entrepreneurial innovation and encourage risk of private capital.	Likely use of ASTM, a consensus-based standards group that includes competitors, makes protection of IP difficult or unworkable, and conflicts of interest likely. ASTM is a discouraging environment for entrepreneurial innovation.
Impact on GA market	Conspicuous progress would do much to give the general market confidence to proceed with product development and end-user purchasing plans. Slow or no progress will mean continued market stagnation and slow recovery.	By its nature, a fleet wide certification effort is a long term effort.
Subject to, or benefit from, peer review process	Limited to applicant staff, DER, consultants, and FAA.	Wide ranging from FAA, ATSM members, petroleum industry, aircraft/engine OEMs, association members, and other stakeholders. Potential issue: consensus may be tainted by competitive conflicts of interest.

Time required to answer critical questions – performance, operability, materials compatibility, fungibility, cost impact vs. 100LL.	Relatively quick, limited variables due to specific engines/airframes. Estimated 1 to 2 years for a candidate knowledgeable, familiar with STC process and capable of performing necessary testing. Assumes cooperative FAA support.	Estimated 5 to 10 years to thoroughly vet candidate fuels and all possible issues affecting a fleet of thousands, with possible and unknown operating limitations and/or hardware modifications. Could be significantly shortened if candidate fuel(s) properties were at least partially known from an STC effort. Similarly, would not waste time on a fuel whose properties were known to be inadequate.
--	--	---

I will continue to encourage the FAA leadership to fully support the existing STC process and use existing guidance as a means to allow candidate fuel producers to pursue approval of their fuels among a defined aircraft/engine population. As an industry, we do not know from whom or where the best unleaded avgas solution will emerge. If the solution were going to come from large-scale industry, it would have likely been discovered in the past 20 years of research. Instead, I think it will probably come from innovative entrepreneurs, unconstrained by conventional thinking and willing to challenge things believed fully understood.

I believe the STC process is more conducive to this sort of innovation, rapid results, and fundamental answers than the complexities of the large-scale deployment that the ARC is working toward. The process being defined in the ARC will absolutely be needed to implement an orderly deployment of the best unleaded avgas, once it is known. But its role in discovering new fuels, or vetting multiple fuel candidates is less certain.

Our industry needs a workable unleaded avgas solution sooner, not later, and toward that end we cannot afford to leave any stones unturned. FAA support for both the ARC and the STC process is essential. Every effort toward finding a solution, and thereby preserving piston engine aircraft operations as a part of our nation’s vital transportation infrastructure, must be encouraged and supported at the highest levels.

Working to represent the interests of owner/pilots on the ARC is vitally important, and I am honored to serve in that capacity. I will continue to encourage any and all means that expedite the discovery of an unleaded replacement avgas, including the STC process.

Respectfully submitted,

Jonathan Sisk, UAT-ARC Member
 President, Malibu Mirage Owners & Pilots Association
 Representing, Clean 100-Octane Coalition of Type Clubs