

**Abbreviated Summary of Michael Kraft's comments, GM of Lycoming Engines  
2/2/2011 Telecon with the Clean 100**

We highly recommend listening to the call, but it is 1 ¼ hours long so if you haven't the time here is a summary, roughly in the order in which items were addressed:

1. The user community's pressure is vital for progress; we must not underestimate the influence this pressure has had over the past year in creating awareness within the FAA, and stimulating action.
2. Many in the user community still don't get the connection between solving the avgas problem for high performance engines and the health of the entire GA economy. This results in a divided community and dilutes influence; the issue needs to be addressed and solved. In particular, the MOGAS advocates don't appear to understand the distribution economics and therefore why a dual fuel solution is unviable except for a very limited application set.
3. That said, there remain considerable other roadblocks in the way – chiefly related to funding for testing.
4. The 2012 \$2Mm funding appropriation that implements the plan developed by FAA to test and certify fuels candidates was passed by the House last year, but remains stuck in the Senate without current prospect for movement.
5. The FAA Reauthorization Bill with language mandating FAA's authority to lead the avgas replacement effort also awaits enactment, although this bill appears to be high on the list for passage with the current congress.
6. The 100 VLL specification has been approved by ASTM and some 100LL today could qualify under this spec and is in the distribution system. 100VLL and 100LL perform equivalently – users are unlikely to be aware of the transition.
7. EPA is fully aware of the 100 VLL effort which should help demonstrate the GA community's serious intention to tackle the problem. While this effort may have given EPA evidence that the industry can correct its own course, GA must still continue to aggressively pursue an unleaded solution.
8. Lycoming believes that the fuel replacement project should be a 10 year process; 2 years to identify the fuel and/or other products required to maintain engine performance, and 8 years to implement. This timeline gives nearly all engines a maintenance cycle within the implementation period. We are well into the first year, if not beyond.....
9. This week, FAA announced the formation of an FAA/Industry committee – known as the Unleaded Avgas Transition Aviation Rulemaking Committee {ARC} – to advise the administrator how to tackle this problem. It is also

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unfunded, so the Administrator will have to transfer funds from elsewhere {he has the authority to do this} to activate it. Lycoming, if asked, will participate.

10. AC20-24B vs AC20-24C, the STC process and ASTM:

- a. The advisory "C" revision occurred due to activities within the jet fuel community {airlines, etc} to {a} define a process that incorporates all the issues to be faced for both performance and quality control matters and {b} to properly describe candidate fuels that will be the basis for approval. The "C" revision provides more detail than "B" and in fact provides a better structure for serious efforts on fuel (and alternative lubricant) efforts. The fact is, there are many "innovators" out there on fuels and lubricants {speaking about turbine fuels} and this more definitive guidance is needed to cull the herd.
- b. FAA requires a "one-size-fits-all" process, which is why GA is being directed to use "C".
- c. Lycoming supports the use of the "C" process, as – in the long run – the company believes it is the best means for eventually achieving fleet-wide approval for the replacement fuel.
- d. ASTM, as a permitted fuel specification vetting body pursuant to the "C" process, is very difficult to manage. It is a consensus body consisting entirely of part-time representatives from organizations with conflicting agenda, and has no effective leadership. This requires the fuel innovators to expend precious resource attempting to manage its progress through ASTM, and they have no experience with this activity. Consequently innovators such as GAMI and Swift remain frustrated, with progress hard to achieve.

11. For the Clean 100, Mike suggests the following kind of activities:

- a. Continued pressure on legislators to pass the Reauth Bill and related appropriations
- b. Continued effort to educate the non-100 octane community of the need for a single fuel solution
- c. Helping to organize an effort to locate and fund a "cat herder" to help the innovators with the ASTM process