

## **Submission to ATAC Board to support unleaded AVGAS research at NRC**

Reference: Presentation "Get the Lead Out" delivered to ATAC Fixed Wing, Air Taxi & Flight training committee on 17 Nov, 2014 by Malcolm Imray, NRC 613-990-4484; malcolm.imray@nrc-cnrc.gc.ca

### **Background:**

- 100LL AVGAS is the only fuel approved for use in most aero piston engine used by ATAC members; lead is required to achieve high octane, for valve guide lubricity, and other properties
- 100LL is the only leaded fuel still mass produced in the world; it constitutes the second largest source of airborne lead pollution
- Environment Canada (EC) & US Environmental Protection Agency (EPA) are pushing for elimination of lead in AVGAS; Transport Canada (TC) & FAA have been able to use aviation safety exemption to date
- US industry and FAA have initiated a Piston Aviation Fuels initiative (PAFI) to develop an unleaded (UL) AVGAS replacement; 4 fuels are now in phase I testing; at least 2 expected to progress to phase II testing in full scale engines and aircraft
- aim is to achieve (near) fleet-wide certification of engines & aircraft using the new fuel(s) by 2018 and to replace 100LL in existing supply chain by 2025
- FAA focusing on non-turbocharged engines due to their engine test facilities; FAA does not have a strong flight test capability for this type of research

### **Transport Canada – National Research Council (NRC) Projects:**

- TC / NRC intend to coordinate with PAFI to address Canadian needs and ensure harmonization of any new regulations, certifications, etc.
- NRC has altitude research facility to test engines and flight research lab to test aircraft so will focus on turbo-charged engines to complement FAA work
- Ground testing to start in FY 2016 to early FY 2018; flight testing to start in FY 2017 until late FY 2018; primarily aimed at horizontally opposed engines but some radial engine testing also planned
- Total project budget approx. \$3.5M; support from NRC, TC, EC to date; negotiations with other government departments ongoing; some in-kind support pledged by Lycoming and Continental Motors (discounted engines/parts; assistance on instrumentation and test procedures)
- *Canadian Owners and Pilots Association (COPA) has committed \$100K from "freedom to fly" fund on behalf of private/recreational pilots of Canada*

### **Support Requested from ATAC membership:**

- NRC requires industry support for the project; seeking financial or in-kind support
- NRC research fleet does not include a suitable UL AVGAS test aircraft; a turbo-charged light twin typical of Canadian commercial fleet sought – e.g. Piper Navajo or Cessna 400 series preferred
- Direct funding (like COPA) or other forms of support can be considered including lease/loan/donation of an aircraft for flight testing and/or engines for ground testing; credit for sponsorship to be determined
- Aircraft will be State registered, on experimental flight permit for duration of project. Can be retried to normal Certificate of Airworthiness pending removal of mods and any required repairs.