



ALASKA AIR CARRIERS ASSOCIATION

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6 December 2012

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Acting Administrator Michael Huerta
Federal Aviation Administration
800 Independence Avenue
Washington, DC 20591

RE: CONTINUED 100LL AVIATION FUEL AVAILABILITY

Dear Administrator Huerta:

Since 1966 the Alaska Air Carriers Association (AACAA) has represented the interests of aviation businesses in Alaska. AACAA is a statewide organization representing over 150 members. Our members meet the needs of the traveling public and rural Alaskans by providing scheduled commuter travel, on-demand air charter, cargo transport, mail delivery, emergency medical evacuation, flight seeing, pilot training, aircraft maintenance, parts sales, fuel sales, storage, rental, and airline servicing.

Leaded aviation fuels carry the bulk of travel in Alaska and any regulatory changes will most drastically affect the State of Alaska and her people. Remote communities, inhabited predominantly by low income minorities, rely upon air transport for all support and services.

Opposition to Premature Regulation

Congressman Waxman's recent letter misses the point on multiple facts. While further reduction of lead from aviation fuel is a worthy goal, the lack of viable alternative fuels that would allow the continued use of high-performance aviation engines would have an extremely negative impact on the residents of the State of Alaska. Premature regulation, before viable fuel alternatives are available, is simply untenable and irresponsible.

At this time we oppose rulemaking on lead emissions from piston-engine aircraft using leaded aviation gasoline for the following reasons:

1. There are no viable fuel alternatives.
2. Increased risks will threaten safety for the traveling public.
3. Alternative—i.e., turbine—engine create greater negative environmental impacts.
4. Research does not link aircraft emissions to environmental lead or aviation lead in humans.
5. Economic hardships from regulation would far outweigh any short or long term benefit.
6. Alaska and rural communities will be disproportionately impacted.
7. Those most affected by the regulation will be low income minorities.

No viable fuel alternatives

The development of low lead fuel was the result of a research and development process funded by the U.S. government in the 1930s and 1940s to improve aviation safety and performance. At considerable expense, the government funded this research to enhance aircraft operations to a higher performance level.

Seventy years later, we believe it is time the government once again fund research and development to replace low lead aviation gasoline (avgas) with fuels that are viable. Before the

Existing to foster and support a stable commercial aviation industry founded upon the principles of safety, professionalism and longevity

AACA is a statewide organization representing over 170 members. Our members meet the needs of rural Alaskans and the traveling public by providing scheduled commuter travel, on-demand air charter, emergency medical evacuation, flight seeing, pilot training, aircraft maintenance, parts sales, fuel sales, storage, rental, and airline servicing.



aviation community can be successfully migrated to an unleaded fuel, the government should fund the necessary research to evaluate alternate fuels, including the economic viability of production and distribution. We would encourage the government to also consider refinement of piston engines for aircraft, because these engines actually operate with lower environmental impacts than turbine engine aircraft per horse power produced.

To be viable, a fuel alternative must provide the same, or nearly the same, performance at a comparable price in all possible flight conditions—at altitude, in extreme temperatures, in high performance engines, etc. To date, all alternative fuels are unproven to perform adequately, particularly for high performance engines, which consume 70% of the leaded aviation gasoline. According to CRC research, while testing produced knock-free operations, all blends used specialty chemicals whose environmental impacts have not been tested and the blend properties did not conform to ASTM D 910.

MOTOR VEHICLE GASOLINE (mogas) – Engines operated on pure mogas have substantial increased wear, shorter engine life, and result in engine failures and cannot be used in the high performance engines. Mogas blended – mogas/lowlead combined—has been offered as capable of providing sufficient lead for valve lubrication, however, this is not the case. The economics are against the use of mogas. Although the fuel is cheaper than leaded aviation gasoline, operational expenses actually increase when engine damage, higher repair costs, and higher overhaul costs are factored into the equation.

ETHANOL BASED FUELS -- When tested in high performance engines, none of these fuels, including ethanol-based fuels, have succeeded due to performance failures in the lab and inability to pass a certification process. Aircraft engine manufacturers consistently release Service Bulletins warning against the use of ethanol based fuels in any of their aircraft.

Increased risk will threaten safety

We encourage adequate research and development prior to rulemaking, as premature rulemaking will result in increased risks and loss of safety for the traveling public. Currently there is no substitute fuel for 100LL, which must be given full weight as EPA constructs regulations using risk analysis. While flying aircraft with low-compression engines using unleaded gasoline usually causes engine damage, flying high-compression aircraft with unleaded gasoline will cause engine failure. Clearly this would be dangerous and have high-risk for human safety.

Until appropriate fuels are developed, engine operations will be compromised, resulting in component damage and potential catastrophic engine failure. Engine manufacturers and overhaul shops repeatedly warn about these results.

In 2010 Cessna released a Service Bulletin on June 1st, entitled “Ethanol Based Fuel Not Approved for Use in Cessna Airplanes.” Their evaluation of alternative fuels included ethanol based fuels approved by FAA STCs for use in some single engine airplanes. Cessna's tests found that ethanol based fuels cannot be considered an alternative to 100LL avgas. The tests also suggested that **OPERATIONAL SAFETY** may be compromised using these fuels. Cessna testing found that ethanol based fuels:

- require fuel flow volume increases of nearly 40% over 100LL.
- are not compatible with some fuel system components (extreme corrosion of ferrous components, salt deposits, jelly-like deposits on fuel strainer screens, and internal separation of portions of rubber fuel tanks).
- may negatively affect electric fuel pumps by increasing internal wear and causing undesirable spark generation.



- are not compatible with some fuel gauging systems and can cause erroneous fuel quantity indications.
- dissolve large amounts of water at conditions down to -77°F, impeding detection and removal of water from the fuel system.
- may block fuel filters and fuel flow.
- can experience heavy losses from evaporation.

Teledyne Continental (TCM) owners' manuals contain warnings regarding the use of automotive fuels in their aircraft engines, stating that this "not only represents a potential safety of flight concern, but can also significantly affect cylinder life and durability." The manuals continue to state the detonation and pre-ignition can result and cause damage to the engine. Engine components have been designed for compatibility with the leaded avgas, and can wear at an accelerated rate with other fuels. TCM "strongly advises against the use of such fuels for RELIABILITY AND SAFETY REASONS" (emphasis added). Until components are redesigned or appropriate fuels developed that perform with these components like the leaded fuel.

Basically all piston engines in commercial use do NOT have any motor fuel FAA STC (Standard Type Certificate) possibilities. The STCs also do NOT allow any use of fuel with alcohol in it. More and more dangerous to any aircraft engine, alcohol in motor fuel is being mandated by government. In most US states you CANNOT get motor fuel that is alcohol free.

All STCs for the use of motor fuel in aircraft recommend use of BLENDED fuel, meaning mixing motor fuel and avgas. These STCs are not blanket approvals for motor fuel use in aviation, but merely allow for supplementation with motor fuel etc. The usual MINIMUM use of avgas in these STCs is to run a full tank of 100LL every 50 flight hours, to keep the valves, valve-seats and valve-guides viable and to prevent deterioration that "can make an engine unusable within as little as 10 hours" according to TCM.

Motor fuel STCs in general only work with low power output privately used engines. These are facts, not just opinions. And alcohol in aircraft fuel tanks is a very deadly problem.

Alternative engines create greater negative environmental impacts

The only other aviation fuel presently in use for aircraft is jet fuel, used to power turbine engine aircraft. A massive conversion to turbine engines, however would result in a significantly higher environmental impact due to an increase in the carbon footprint of turbine aircraft engines compared to piston engine aircraft to provide the identical level of effort.

High performance piston engine aircraft are in truth a more environmentally friendly method of power for general aviation and short-haul freight aircraft due to a lower carbon footprint. Assume the following from EPA data.

- Low lead aviation gasoline has a carbon footprint of 152.7 lbs per Million BTU
- Jet fuel has a carbon footprint of 156.3 lbs per Million BTU
- Low lead aviation gasoline produces 18.355 lbs carbon dioxide (CO²) per gallon*
- Jet fuel produces 21.095 lbs carbon dioxide (CO²) per gallon*

*Source: US Energy Information Administration, *Independent Statistics & Analysis*

Because the turbine engine aircraft burns more fuel, it must carry that fuel, thus reducing the payload for the aircraft, resulting in more trips to deliver the same amount of freight or passengers. Thus, the final carbon footprint will actually be nearly three times greater than the footprint of a piston powered aircraft.



EXAMPLE #1: CESSNA 206 -- Let us consider operation of a Cessna 206 aircraft. Comparing the aircraft's operation with a turbine engine to operation with a piston engine, to achieve the same performance level, we can substantiate the following data. Note that the carbon footprint more than doubles for the turbine engine aircraft to perform the same task.

Turbine	28.7 gallons/hr	producing 605.6 lbs of CO ² /hr
Piston	16.0 gallons/hr	producing 294.4 lbs CO ² /hr

EXAMPLE #2: LARGE CARGO AIRCRAFT – Let us equalize the quantity of fuel burned per hour for two types of aircraft, and examine the difference in service performed by the aircraft. A large piston engine powered cargo aircraft that travels at 150 kts per hour will transport 7,500 lbs of freight, or 32 passengers, burning the same gallons of fuel per hour as a twin engine turbine powered aircraft that carries 2,800 lbs of freight, or 18 passengers, and travels at 150 kts. The difference in performance is obvious. These aircraft examples were chosen for their ability to access community class airports built in remote regions, as these airports are usually gravel surfaced and less than 5,000 feet in length.

Research has not linked aircraft lead emissions to that found in humans

The data in the EPA study “Development and Evaluation of an Air Quality Modeling Approach for Lead Emissions from Piston-Engine Aircraft Operating on Leaded Aviation Gasoline” provides no direct connection in health studies to lead emissions from aircraft. Within the studies, some controls were in place, however, research has not established acceptable baseline data to declare that lead came from aircraft as opposed to lead remediation, lead in/on the ground from prior motor fuel usage, other industrial activities, etc.

No true health studies have been done on individuals in these areas correlated to a national average. As stated on page 22459 of the Federal Register, the ANPRM admits that “lead emission rates are based on the lead concentration in fuel and not direct emission measurements.” Gross assumptions are made that are not substantiated with qualified data.

Also, assuming that roadless area airports are the only potential source of lead contamination is inaccurate. Lead paint, construction and demolition, off road vehicle operation, and historic uses of lead occurred prior to, and simultaneously with, aircraft use in many of these areas.

Life in much of rural Alaska relies solely upon aviation transportation, and many people in Alaska have worked in and around leaded aviation gasoline their entire lives. Section V, Part 4 of the ANPRM states that the “general public for whom flying is a recreational activity may be the most highly exposed population to lead emissions from piston-engine activity.” Alaskans use piston-engine aircraft as a way of daily life, and are subjected to much greater exposure than the national “general public” average.

The EPA is encouraged to conduct sampling to determine lead contamination and absorption, and to use Alaska as a testing ground. We believe that the EPA must design and perform research directly related to this issue, not refer to peripheral studies and by inference make avgas a culprit.

For example, one Alaskan family just had the blood of all family members tested and no lead was present at levels that could be detected. Lead level testing was to <2 on a "0-10" scale. The family's home is exactly under the flight path of these large and small 100LL piston aircraft in and out of the airport.

Economic hardships from regulation would far outweigh any benefit

Compared to comparable turbine engine aircraft, piston engine aircraft require a lower initial capital investment for the aircraft purchase. Then, day-to-day operations require a smaller capital outlay for



fuel, due to the lower fuel burn per work produced. Seventy percent of the leaded aviation gasoline consumed is used by thirty percent of the aircraft: those with high performance engines. These aircraft are not generally used for recreation, but for the essential transportation of passengers and freight, and for emergency medical services.

The EPA cites predictions of an increase in pilot numbers, corresponding to a 0.7% increase in GA pilots, 1% increase in student pilots, and private pilot increase of 0.2%. For the past decade, at a minimum, numbers of pilots and mechanics have dropped as the aviation industry continues to decline nationally. Alaska does experience an increase in pilots and aviation, due to federal expenditures for natural resource development and protection.

If new regulations are imposed on leaded aviation gasoline, during these difficult economic times, the economic burden will be amplified upon the industry and the customers served across the nation and exponentially in Alaska. It needs to be fully understood that small businesses operate with very small profit margins, and it is likely that adjusting to changes, however large or small, will have the very real consequence of both job loss and business closures.

Alaska and rural communities will be disproportionately impacted.

Regulation of leaded aviation fuels will most drastically affect Alaska and her people. Alaska has the largest geographic aviation system in the US, and includes 700 airports and 1,200 airstrips. Of these airports and airstrips less than 5% are paved, the rest being gravel, dirt or grass—in the summer, with packed snow and ice in the winter. Given that the state occupies an area approximately 1/5th the size of the lower 48-states, with only about 3% of the nation's interstate highway miles, aviation is the major form of year-round transportation. <http://www.fhwa.dot.gov/ohim/hs01/hm41.htm>

Eighty-two percent of our communities are not accessible by road and rely on air transport for life sustaining goods and services. Aviation is a basic mode of transportation and the small general aviation aircraft is the equivalent of the mini-van for a family in Bush Alaska. When someone needs to go to the hospital, they typically travel by piston driven aircraft.

Over 10,000 piston engine aircraft are registered in the State of Alaska and provide the primary means of transportation. They are the backbone of transportation for the State.

The ANPRM assumes, and states, that jet fuel is “the fuel utilized by most commercial aircraft.” This is definitely not a true statement for aircraft in Alaska. Turbine engine aircraft comprise 4.5% of the fleet, and piston engine aircraft are the other 95.5%, of which 37.7% are high compression engines and 57.8% are low compression engines.

High performance piston engine aircraft provide everything to sustain life for rural communities, but deliver over 90% of the fuel used in remote Alaska. These deliveries include all fuels for heating, lighting, cooking, motor vehicle operations, lubrication, construction, maintenance, equipment operations, and support the functioning of hospitals, clinics, schools, businesses and all service provisions. For these operations, heating oil, drummed oil, unleaded motor fuel, aviation gasoline, jet fuel, propane, and methanol. The list of villages and towns served is an alphabet of Alaskan life. In the past year, a single carrier has delivered 4,291,119 gallons of these fuels by piston engine aircraft to: Allakaket, Alpine, Anaktuvuk Pass, Aniak, Arctic Village, Atkasuk, Barter Island, Barrow, Beaver, Beluga, Birch Creek, Cape Yakataga, Chalkyitsik, Chandalar, Clarks Point, Dahl Creek, Donlin Creek, Drift River, Ekwok, Emmonak, Ewok, Fort Yukon, Good News Bay,



Granite Mountain, Hog River, Hughes, Iliamna, Indian Mountain, Kalakaket, Kavik, Keyes Point, Kokhanok, Levelock, Manley Hot Springs, Manokotak, Marsh Creek, McGrath, Minchumina, New Stuyahok, Nightmute, Nikolai, Nixon Fork, Noatak, Non Dalton, Nuiqsut, Nyak, Pedro Bay, Port Alsworth, Portage, Rampart, Savoonga, Shugnak, Sleetmute, Sparrevohn, Stevens Village, Trading Bay, Twin Hills, Tyonek, Umiat, and Venetie.

Aviation in Alaska provides \$3.5 billion to the State’s economy, is eight percent of the Gross State Product, and is the fifth largest employer in the State, employing 10% of our total workforce. While population growth and natural resource development is a key driver of growth in air travel for Alaska, aviation itself is a key cause and facilitator of economic growth for the State of Alaska. Most businesses in Alaska are small businesses, and operate on very small economic margins to remain financially viable.

Alaska’s people travel by air eight times more often per capita than those in the Lower 48, and ship 39 times more freight per capita—nearly one ton per person per year. To put this in perspective, we must compare Alaska fuel usage to national fuel usage.

While the national average for aviation fuel consumption is less than 9% of that used for highway travel, in Alaska aviation fuel consumption is over 40% of highway consumption. The following table illustrates data compiled by the US DOT Bureau of Transportation Statistics (2005) and State of Alaska Department of Revenue statistics (2009).

AVIATION FUEL CONSUMPTION COMPARED TO HIGHWAY USE

<u>FUEL</u>	<u>CONSUMPTION</u>	<u>% OF MOTOR FUEL USED</u>
<u>NATIONWIDE</u>	(in million gallons)	
Highway Fuels	175,197	
Aviation Fuels	15,289	8.88%
Aviation Gasoline	255	0.15%
Jet Fuel	15,034	8.73%
<u>ALASKA</u>		
Highway Fuels	387.6	
Aviation Fuels	156.4	40.35%
Aviation Gasoline	13.1	3.38%
Jet Fuel	143.3	36.97%

Section V, Part 4 of the ANPRM provides national statistics for general aviation flight hours. It should be recognized that Alaskan aviation use is 22.5 times greater when compared to the national figures comparing motor vehicle fuel use and aviation fuel use.

Regulation will disproportionately affect low income minorities

Alaska’s extremely remote communities are inhabited predominantly by low income minorities, who rely upon air transport for all support and services. Eighty-two percent of Alaskan communities are dependent on piston engine aircraft for the sustainment of life, which includes the delivery of all goods, supplies, food, health care, and emergency medical response.

These people are the least able to cope economically with the repercussions of any proposed regulation. If economically viable fuel alternatives are not part of any regulatory change, the cost escalations for aviation operations to Bush Alaska will result in the devastating displacement of our indigenous peoples. The natural



FAA Administrator Huerta
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marine environment has defined subsistence lifestyles and cultures that date back more than 8,000 years. The rich heritage of Alaska's eleven cultural groups draws upon the lifeways of centuries, the wisdom of elders, and traditions that endure in their communities for future generations. To decimate these populations would be an inexcusable travesty. The people of Alaska and the United States are committed to perpetuating Native societies and encouraging continued cross-cultural exchanges among all people to strengthen our entire nation.

Conclusion

We emphatically disagree with bowing to public pressure for a knee-jerk rulemaking on lead emissions from piston-engine aircraft using leaded aviation gasoline. The potential for far-reaching negative impact from resulting regulation on this issue cannot be adequately conveyed in the limited words of an ANPRM response.

The federal government should commit to a substantial research and development program for aviation fuels and produce a viable fuel alternative prior to any regulatory changes. The \$2 million allocated to date is an insignificant amount. Research should work to improve aviation fuels up to as much as 145 octane for piston engines to insure environmentally friendly operations.

We must insure the continued performance of high powered engines as well as encourage their environmentally-friendly use for those mission profiles that involve low altitude flight. In the interim, we should continue to use the low lead aviation gasoline as the best current resource—economically, socially, and environmentally.

Regulatory considerations must adequately consider all ramifications, including the economic hardships imposed upon the people of the United States. To not create undue economic hardship, a 25-35 year transition period must be provided for aircraft operators.

The potential higher costs of operations will not be affecting wealthy recreational joy riders; it will most emphatically and negatively affect those peoples who reside in rural locations across the United States, countries across the globe currently developing an infrastructure, and Third World countries.

Sincerely yours,

A handwritten signature in black ink, appearing to read 'C. Joy Journey', is written over a printed name.

Executive Director

Cc: Congressman Don Young
Senator Mark Begich
Senator Lisa Murkowski