



## LOBO White Paper

### FAA Safety Team (FAASTeam)

### Sebring Summit January 20, 2011

The Lancair Owners and Builders Organization (LOBO) is pleased to participate with the FAA and industry in the FAA Safety Team (FAASTeam) Sebring Summit January 20, 2011. LOBO is an international type club for Lancair owners, builders, fliers and enthusiasts who support the Lancair kit aircraft fleet. LOBO was formed in the fall of 2008 in response to a need to provide support to Lancair owners. There are approximately 250 LOBO members. There are nearly 1000 Lancairs issued an airworthiness certificate in the United States. Lancair was founded in 1981 and has sold over 2000 Lancair kits worldwide. Including the prototype Sentry there are eleven different models of the Lancair fleet:

Lancair 200 2-seat kit powered by a Continental O-200 engine, released in 1985

Lancair 235 2-seat kit powered by a Lycoming O-235 engine, released in 1986

Lancair 320 2-seat kit powered by a Lycoming O-320 engine, released in 1988

Lancair 360 2-seat kit powered by a Lycoming O-360 engine, released in 1988

Lancair ES 4 seat fixed gear TCM IO 550

Lancair IV 4 seat retract TCM IO 550 (non pressurized)

Lancair IV-P 4 seat retract TCM TSIO 550 (5 psid pressurized)

Lancair Legacy 2 seat retract and fixed gear versions TCM IO550 and a 360 version

Lancair Propjet 4 seat retract Walter 601 turboprop (5 psid pressurized)

Lancair Sentry 2 seat tandem Walter 601 turboprop

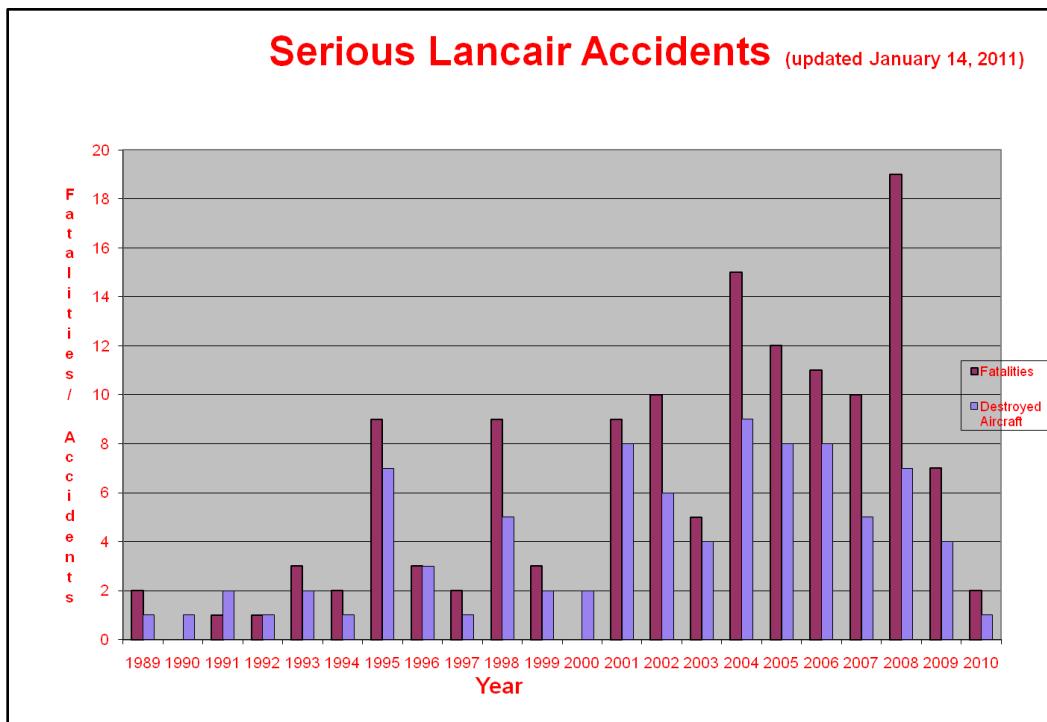
Lancair Evolution 4 seat retract PWC PT6A-135A turboprop (6 psid pressurized)

The following graph details the distribution of Lancair model specific information.

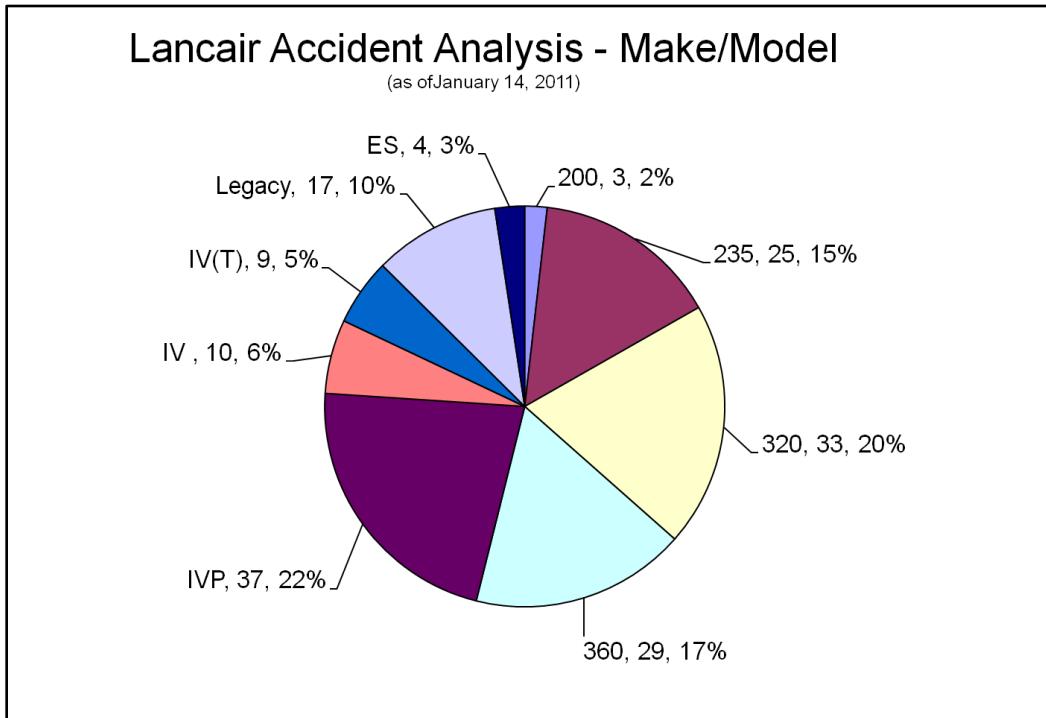
Disposition by Type			
Type	Kits Sold	Flying	Crashed/Destroyed
Lancair 200/235	270	103	28
Lancair 320/360	910	301	62
Lancair ES	251	96	4
Lancair IV/IV-P	586	240	47
Lancair IV-PT	128	57	9
Legacy	369	121	17
Lancair Evolution	35	4	0
Unknown type	52	-	-
<b>Totals</b>	<b>2601</b>	<b>922</b>	<b>167</b>

## LANCAIR SAFETY

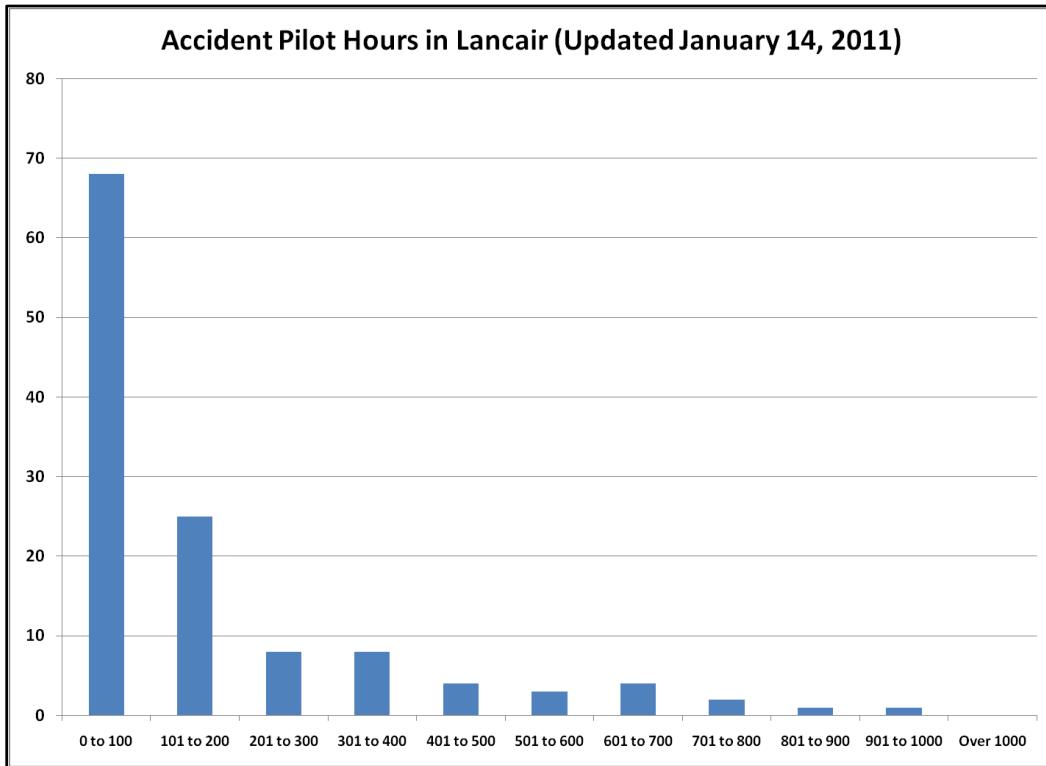
There are approximately 167 reported Lancair accidents in the LOBO maintained database. The first serious accident in a Lancair occurred at Fond Du Lac, WI on 8/1/1989 during AirVenture and involved a fatal stall/ spin accident during a base turn to final. As more and more Lancairs receive airworthiness certificates, more accidents have occurred on an annual basis. 2008 has been the worst year thus far with 19 fatalities and seven destroyed aircraft. 2009 saw a large reduction in accidents and fatalities since 2008—over a 50% reduction. 2010 accident numbers declined to the best in ten years. LOBO has been working vigorously to reduce the Lancair accident rate. LOBO's efforts will be discussed elsewhere in this paper.



All models except the Sentry and Evolution have been involved in serious accidents. There have been no accidents involving pressurization.



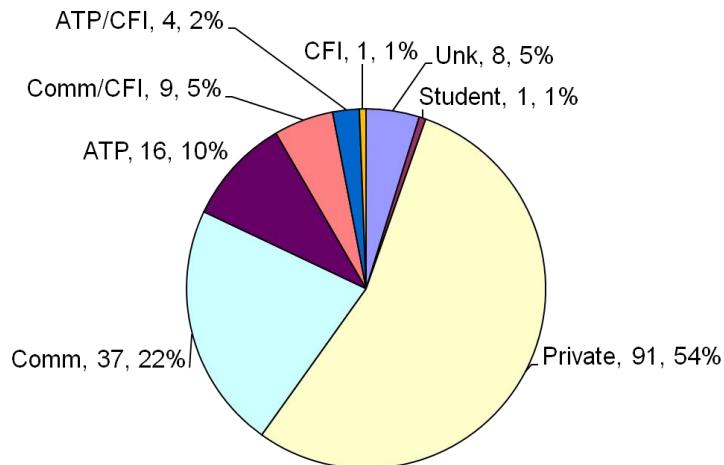
A significant risk factor associated with Lancair accidents is “low time in type” and “pilot certificate level”. Approximately 44% of all Lancair accidents have involved pilots with less than 100 hours in model. This figure closely follows the GA accident statistics where 46% of the private pilots involved in accidents have less than 100 hours in make/model (as reported by the 2008 Nall Report). While turbine aircraft over 12,500# require type specific training, anyone with a private pilot certificate can purchase and fly a Cessna 421, Beech King Air 90, Lancair IVP or Evolution with no additional training required. It is no surprise then that uninitiated, overconfident pilots contribute significantly to the GA accident statistics. THIS IS THE ELEPHANT IN THE ROOM.



Fifty-six percent of all Lancair accidents have involved private pilots. Again this follows GA numbers but it is noteworthy that while private pilots account for about one third of all pilot certificates they inflict over one half of the accidents.

The AOPA addressed this in their 2009 Nall Report with the following comments: "Private pilots were involved in 50% of all accidents and 52% of those that were fatal (Figure 11). They make up 36% of all active U.S. pilots [211,000 of 595,000 pilots] but a larger share of those flying non-commercially, since they are ineligible to command commercial flights. For this reason, and because of the lack of reliable data on their risk exposure in terms of either number of flights or total flight hours, it is not clear whether private pilots are at excess risk compared to pilots at higher certification levels. Private pilots are less likely to have sought advanced training ..." AOPA 2009 Nall Report  
 LOBO believes the private pilot flies fewer flight hours than the pro pilot and consequently has an accident rate skewed towards more accidents per hour than any other certificate level. This statistic must be confirmed analytically so scarce resources can be targeted properly.

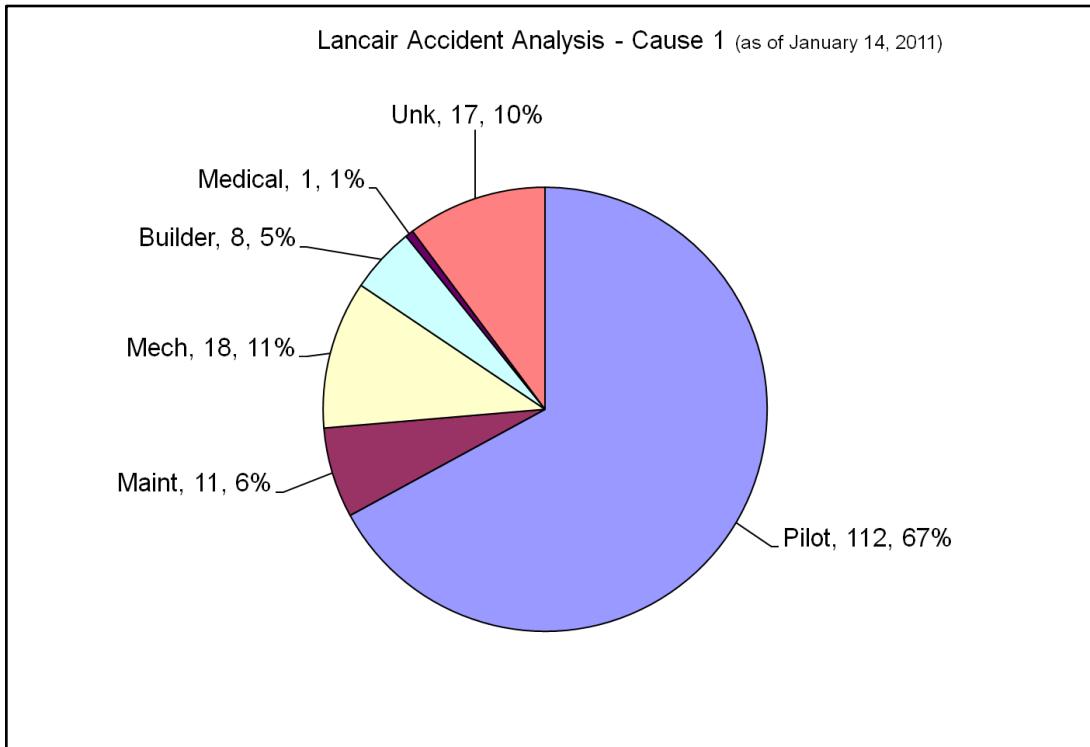
## Lancair Accident Analysis - Pilot Certificates (as of January 14, 2011)



Better pilot training and testing in GA is required to correct the above deficiencies and some of this can be corrected with amendments to the Practical Test Standards by requiring more landings and more high alpha air work and stall demonstrations on check rides, etc. As explained elsewhere, the root cause of many of these accidents is a poor understanding of aerodynamics and aircraft performance and handling by the average GA pilot. Training at the student pilot level must be improved in order to have a long term positive effect throughout GA and EXP AB. Recurrent pilot training must improve and type training is strongly recommended.

At the other end of the spectrum is that there are no serious accidents involving Lancair pilots with more than 1000 hours in model. The only LOBO member accident to date occurred to a pilot who suffered a propeller loss in flight, made a successful engine out landing on a beach, only to hit a jogger.

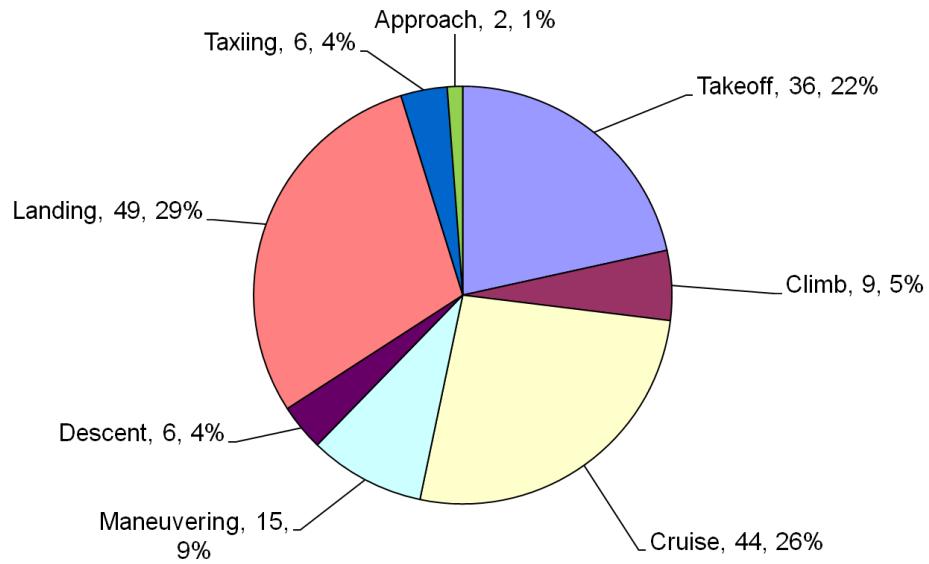
Pilot error leads Cause 1, mirroring General Aviation. Poor decision making, insufficient aeronautical skills, and other factors contribute to the pilot error accidents. Egregious and blatant acts of illegal flying have been a factor in more than one Lancair accident including flatlining, non rated pilots filing IFR flight plans, low altitude aerobatic flight in the traffic patterns, etc. A campaign urging pilots to "Fly Responsibly" is long overdue. LOBO has embraced a Code of Conduct for its members.



Phase of flight accidents again mirror GA statistics with takeoff and landing accidents accounting for over one half of all Lancair accidents. Hard landings, bounced landings, loss of control on landing or takeoff, runway excursions, etc. comprise these accidents. Again, lack of skill that can be remedied with training at the entry point (GA private pilot flight training) and at the transition point (Lancair purchase). Some Lancair pilots eschew training but for the IV series and Evolution fliers insurance requirements mean annual training with a approved training provider.

## Lancair Accident Analysis - Phase of Flight

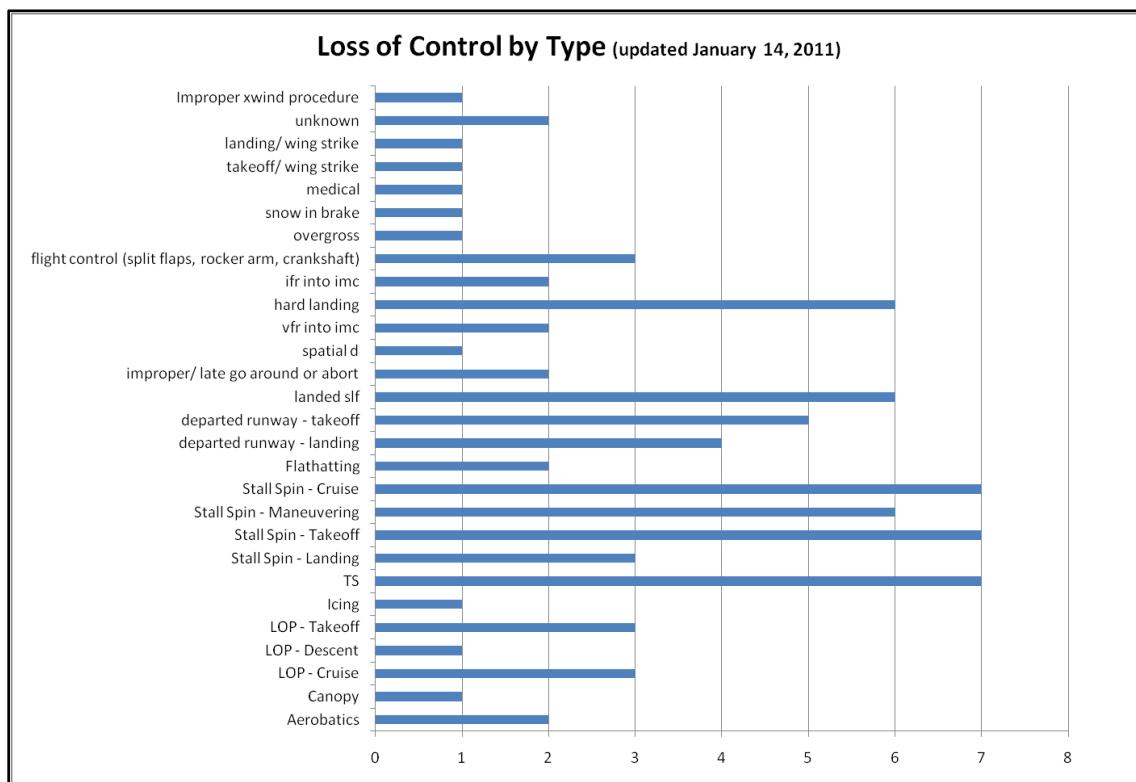
(as of January 14, 2011)



## LOSS OF CONTROL (STALL/ SPIN)

There have been 73 loss of control accidents involving Lancair aircraft since 1989. Loss of Control (LOC) as defined by LOBO involves an accident whose cause can be attributed in part to the pilot's inability to properly control the aircraft. The pilot stops flying the airplane and the airplane starts flying the pilot. This can be a classic stall or spin, a runway excursion, etc. The aircraft involved in the LOC accidents have been all Lancair models except Sentry and Evolution.

Twenty five of those accidents involve a classic stall/ spin either as a primary cause 1 or secondary cause 2-5. Eleven of those accidents involved a Lancair IV series aircraft. In six IV series LOC accidents the LOC was the primary event. Five IV series accidents involved an initiating event (loss of power, thunderstorm penetration, etc.) before control was lost. One involved wake turbulence encounter on takeoff, one involved a fuel starvation and one involved a thunderstorm penetration and loss of control. Two of the stall spin accidents have occurred with flight instructors aboard giving stall training. Three of the accidents involved flight testing in Phase I.



Most Lancair aircraft do not have any stall strips to give a solid aerodynamic buffet pre-stall or encourage a Part 23 type stall response. Many later vintage Lancair aircraft are equipped with EFIS like Chelton that have internal "bitchin Betty" stall warning systems

or the Proprietary Systems AOA system. The calibration of the stall warning systems is important for proper function on the aircraft. The Evolution, if it is equipped with stall strips is 14 CFR 23.49 and 14 CFR 23.201, 203 and 207 compliant. The Lancair IV series aircraft does not appear to have a significant risk of stall accidents once the other factors are understood.





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## RISK MITIGATION STRATEGIES

In 2008, LOBO drafted a FITS-endorsed training syllabus and completed its review by early 2009. Since its introduction in 2009, LOBO has worked with the insurance industry to gain its acceptance of the syllabus for transition and recurrent training. LOBO members and non-members can seek flight training from LOBO endorsed flight instructors who themselves have completed LOBO's standardization and evaluation training program. Pilots must complete the entire FITS syllabus to receive a graduation certificate. LOBO is committed to raising the bar.

Experimental AB aviation suffers from training issues not found in many other aspects of GA. These include regulations, lack of training aircraft availability, as well as a dearth of qualified instructors. As many of you know there is a prohibition on training while the aircraft is in Phase I (test) due to operating limitations restrictions. It seems we are taking a step backward with this rule. If we are going to train our way out of the current accident rate we need to revise the rules. Our members have a Catch 22 situation -- they can't get training until they fly off their hours and they can't fly until they train. No wonder the accidents are up. This topic was addressed at SNF with the FAA. We need to fix this.

Additionally 14 CFR 91.319 prohibits commercial training in experimental aircraft.

The current FAR Part 91.319 states:

<p>(e) No person may operate an aircraft that is issued an experimental certificate under §21.191(i) of this chapter for compensation or hire, except a person may operate an aircraft issued an experimental certificate under §21.191(i)(1) for compensation or hire to—</p> <p>(1) Tow a glider that is a light-sport aircraft or unpowered ultralight vehicle in accordance with §91.309; or</p> <p>(2) Conduct flight training in an aircraft which that person provides prior to January 31, 2010.</p>
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The FAA has recently reinstated the EXP-AB 319 waiver / LODA process for "flight instruction for hire" program. The EAA ran the program for many years and then in 2006 the FAA brought it in house under Notice N8700.47 with an expiration date of 8/10/2007 where it was supposed to be incorporated under the 8700.1 FSIMS system. Look what happened to our accident rate after the policy change in 2006. It went up! While the LODA process has been reinstated, time will tell if it is an effective program.

Here is the current language from the 8700.1:

**"3-292. AIRCRAFT INSTRUCTION.**

**A. Use of Aircraft for Instruction.** *An aircraft with an experimental airworthiness certificate may be used for crew training or flight instruction when no charges or remuneration for use of the aircraft are involved. A pilot or owner may use the services of an instructor to receive instruction in an experimental aircraft; however, a commercial operator may not provide such an aircraft for the purpose of flight instruction for hire.*

**B. Flight Instructors.** *A person who is the owner or operator of an experimental aircraft may receive flight instruction in that aircraft and pay for the flight instructor's services. However, this person must be the owner or operator of the aircraft in order for the flight instructor to receive compensation."*

One member reported 8900.15 might be the fix—here is what he wrote last spring.

I am working with the Boston FSDO to get a Letter of Deviation as permitted by 91.319(h).

My current principal point of contact is Thomas MacMurtry. He will likely not be the final contact person.

After some research on their side all indications are that they expect to be able to issue this letter using the (now expired) process in notice N 8900.15. I have passed Thomas a very simple proposal letter requesting the approval and the LOBO course materials. I asked him to review the letter and help me put it into final form. He is working with (as yet unidentified) OPS person in the Boston office to review this.

In our phone conversations Thomas has indicated that he expects them to be able to issue a LODA with a long list of operational rules patterned after similar programs issued to the military and jet demo guys. He went through the list with me and the only special rule that seemed significant was a requirement for what amounts to 100 hour inspections by a certified mechanic or repair station. When I see the details on this it will probably require that the annual be signed off by an A and I rather than the A and P requirement for an experimental aircraft. I do not know if a signoff by the builder (with repair station/manufacturer authority) will qualify. In any case for me this is no hardship at all since my annuals are signed off in this way anyway.

He reported on 1/13/2011 that he received his LODA – over a year after starting this process. This situation must be remedied if we are to improve flight safety. We must eliminate roadblocks to training. Training in a “similar” certified aircraft does not suffice in many cases.

## LOBO—TYPE CLUBS WORK!

LOBO is committed to reducing the Lancair accident rate. In two years the Lancair fleet has gone from the worst accident rate since 1989 to the best. What has LOBO contributed to this success? Encouraged by EAA's Earl Lawrence, five Lancair owners formed LOBO in October 2008. It was no coincidence that LOBO was formed during the worst year for Lancair accidents. Type clubs work—people who belong to type clubs have a significantly lower accident rate than non-members.

LOBO's Board is filled with subject matter experts. We are reaching out to members and non members who build and fly these fast glass aircraft. LOBO encourages and fosters responsible flying through its newsletters, social events, bylaws, website and training events.

In addition to flight training, LOBO has been educating Lancair owners with respect to maintenance of their aircraft. LOBO has hosted three maintenance clinics across the country and has four scheduled several for 2011. The goal is to raise the level of knowledge of Lancair maintenance requirements and reduce EXP-AB maintenance related accidents.

LOBO recommends fostering the growth of EXP-AB type clubs and subject matter experts across the EXP-AB world. We work at the grass roots level. LOBO appreciates the opportunity to contribute to this effort to improve EXP -AB safety.

Lancair Owners and Builders Organization