



From Worst to First

How LOBO helped the Lancair Community
improve its Safety Record

Jeff Edwards, Ph.D., ATP, CFI, Founder LOBO







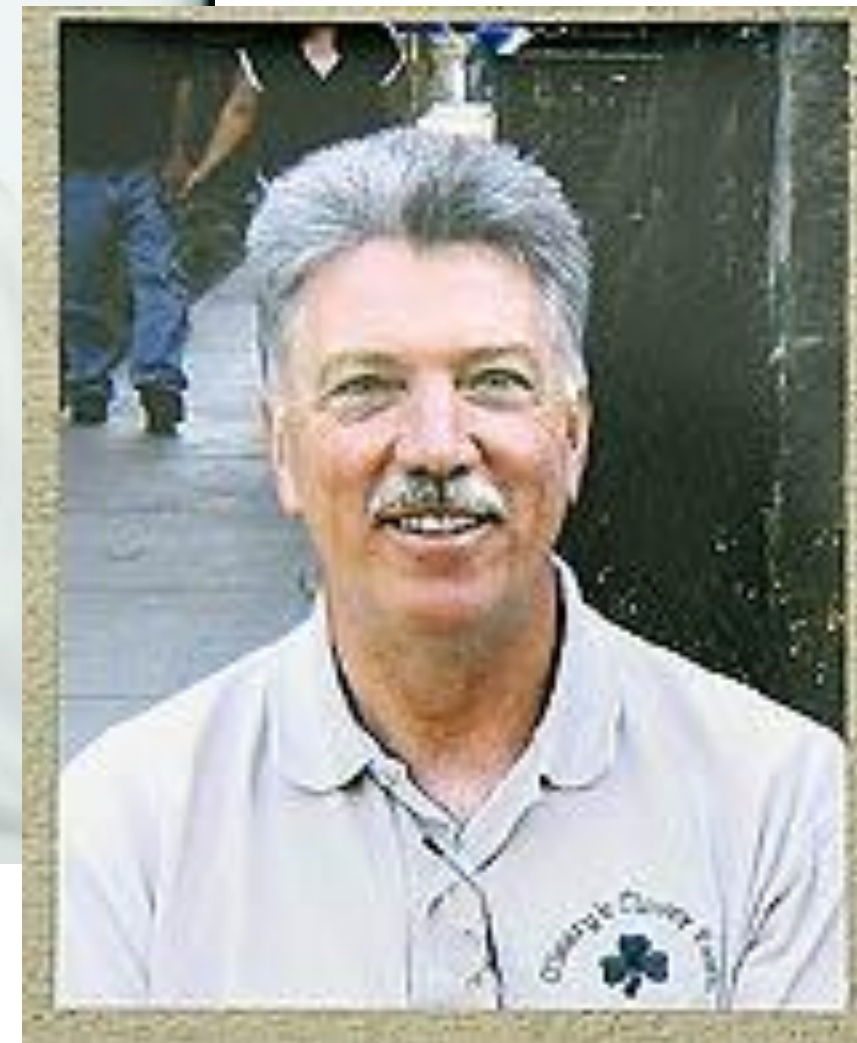






Every single safety procedure 'failed' in DC aircraft collision: Dr. Jeff Edwards
Aircraft accident investigator Dr. Jeff Edwards gives his take on what caused the aircraft collision near Washington, D.C. on 'Fox News Live'.

N515RB Roger Bock 7/31/2008



- Numerous witnesses observed the aircraft and generally described the aircraft as on approach to runway 27, hearing the engine running, and then observing a sudden bank and seeing the aircraft hit inverted and slide to a stop.
- An on-scene inspection of the engine and airframe did not disclose any evidence of preexisting anomalies with either.

N515RB Roger Bock 7/31/2008



- Pilot trained but did not successfully complete training—recommended more training... pilot refused
- Flew with Legacy owner in CLE area
- Wife said Pilot had heart attack w/i 12 mo prior to accident—likely unreported

Are you your brother's keeper?

- We should work together to reduce the accidents.
- Recommend training to new Lancair pilots
- Introduce them to the LML
- Form LOBO
- When all else fails....



Five Lancair Fliers form LOBO

- Following fatal accident at Airventure five Lancair owners formed LOBO to address safety issues.
- I reached out to Nancy Johnson at ABS HQ for ideas on forming type club... she said, “if you build it, they will come”.



LOBO Mission Statement



"Our Commitment and Values

LOBO is dedicated to creating a safe and vibrant community for Lancair and Evolution aircraft owners, builders, and pilots. We focus on promoting aviation safety, providing educational resources, and advocating for our members' interests through:

- Safety and Education
- Offering training events, maintenance clinics, and access to expert technical advice.
- Community and Fellowship
- Encouraging collaboration and communication among members.



U.S. Department
of Transportation
**Federal Aviation
Administration**

InFO

Information for Operators

InFO 09015
DATE: 9/25/09

Flight Standards Service
Washington, DC

http://www.faa.gov/other_visit/aviation_industry/airline_operators/airline_safety/info

An InFO contains valuable information for operators that should help them meet certain administrative, regulatory, or operational requirements with relatively low urgency or impact on safety.

Subject: Safety Concerns of Lancair Amateur-Built Experimental Airplanes

Purpose: To alert owners/operators and pilots about a Federal Aviation Administration (FAA) operational safety concern regarding the Lancair amateur-built airplanes operating under an experimental airworthiness certificate.

Background: FAA analysis of fatal accidents for Lancair airplanes operating under an experimental airworthiness certificate has revealed a large and disproportionate number of fatal accidents for their fleet size. The Lancair fatal accident rate is substantially higher than both personal-use general aviation as well as the overall fatal accident rate for all amateur-built experimental aircraft. For example:

- While representing a little over 3 percent (%) of all amateur-built fatal accidents over the last 11 months,
- During the last 11 months, nearly 65% of all Lancair fatal accidents were fatal.
- Over the last four years, 53% of all Lancair accidents were fatal. The majority were due to apparent stall/spin accidents during slower flight, such as flying in airport traffic patterns.
- During this same period, 60% of all Lancair fatal accidents were the result of apparent loss of control, and nearly 60% of these occurred in the traffic pattern.

The Lancair is not type certificated in accordance with part 23 – Airworthiness Standards: Normal, Utility, handling, and stall characteristics for the Lancair a general aviation airplanes that are type certificated certifications standards, the Lancair is a high-performance, hand-made (non-production) aircraft. Each individual Lancair airplane can have unique handling, stability, and stall characteristics. The fatal accident record indicates that these unique differences can expose pilots to additional risk during slow-speed operations while close to the ground and with little time to recover from an unintentional stall. Understanding these differences is critical for safe operation of the aircraft.

Recommended Action: The FAA recommends that pilots operating the Lancair amateur-built experimental airplane do the following:

1. Review and thoroughly understand all available information regarding the slow-flight and stall characteristics of their own Lancair. In addition, obtain specialized training from a certificated flight instructor (CFI) in their Lancair model or other similar high-performance airplane to experience slow flight handling characteristics, stall recognition, and stall recovery techniques.
2. Install a high-quality angle-of-attack (AOA) indicator to provide warning of an impending stall. Owners that already have an AOA indicator installed should have the calibration validated to assure proper operation. Lancair flight characteristics, including stall speeds, can vary from airplane to airplane, and many Lancairs have been known to stall with little or no warning.
3. Lancair owner/operators should have their aircraft evaluated by a mechanic with Lancair maintenance experience for proper rigging, wing alignment, and weight and balance.
4. Lancair airplane builders should use the services of experienced and qualified construction evaluators who are familiar with the Lancair construction, rigging, flight, and handling characteristics. This should be done before further flight.

Contact: Questions and comments on this InFO should be directed to the Flight Standards Service, General Aviation and Commercial Division, Certification and General Aviation Operations Branch, AFS-810, telephone 202-267-8212.

Its Just Business!



AIG Aviation, Inc.
100 Colony Square
1175 Peachtree Street NE, Suite 1000
Atlanta, Georgia 30361-6227

Telephone (404) 249-1800
Facsimile (404) 249-1917

249-1292

- Your aircraft type community is just as good as your worst pilot

AIG Aviation, Inc. has long been proud to have been one of a select few willing to offer coverages on the Lancair IV family of aircraft. However, due to recent adverse loss history on this type of aircraft, and so that we can continue to offer coverages on these aircraft going forward the underwriting standards on the Lancair IV family of aircraft have changed significantly.

In order to meet the legal requirements of your state, your current policy will not be renewed as described in the attached notice. We are sending this note along with our official notice so you would know that in most instances we may be able to offer terms on your aircraft again.

Lancair IV family of aircraft have changed significantly.

In order to meet the legal requirements of your state, your current policy will not be renewed as described in the attached notice. We are sending this note along with our official notice so you would know that in most instances we may be able to offer terms on your aircraft again.

If you would like to receive a quote, please submit a new application with current up-to-date information. Please note that the differences you may notice in the new terms could include, but may not be limited to, changes in deductibles, training and inspection requirements, as well as pricing increases. Please review your quote carefully with your agent so that you understand these changes and how they may affect you.

If you have any questions or need an application please contact your agent.

Regards,

A handwritten signature in black ink, appearing to read "JT Helms".

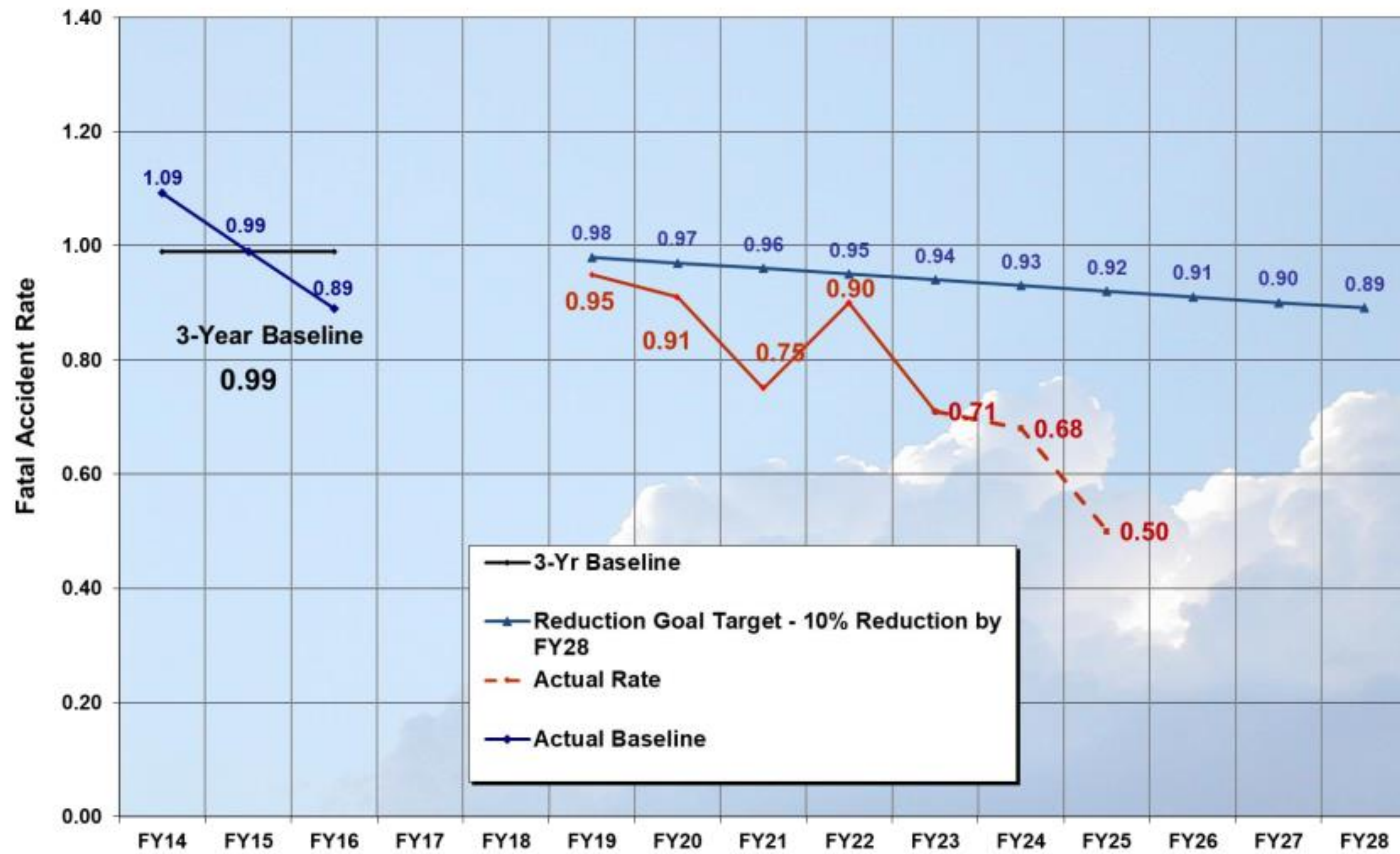
John "JT" Helms
Assistant Vice President

General Aviation Joint Safety Committee



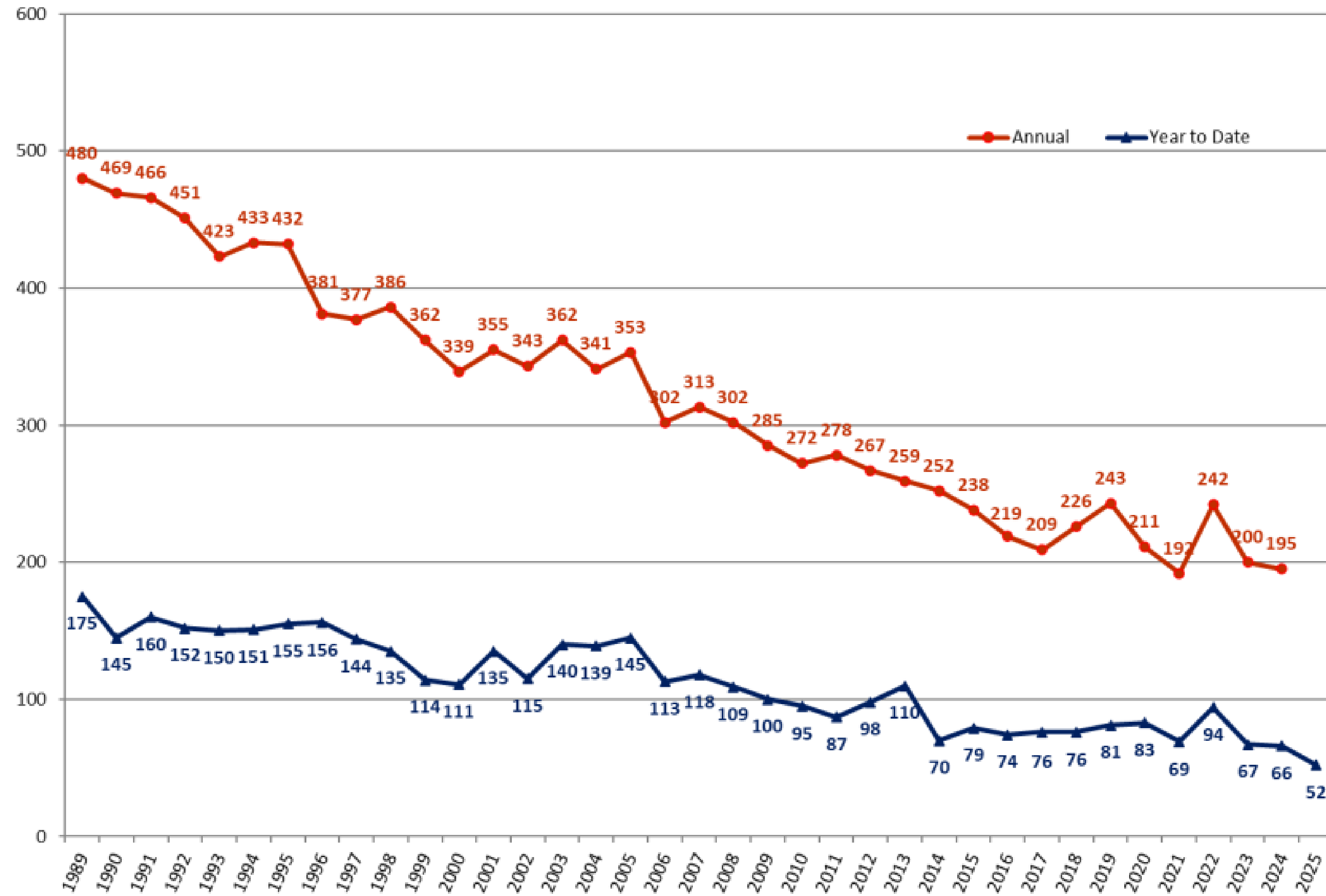
Federal Aviation
Administration

AVS Safety Performance **GA Fatal Accident Rate** (Fatal Accidents/100,000 Hours)



General Aviation Fatal Accidents

General Aviation Includes General Aviation and Unscheduled Part 135



Federal Aviation
Administration

FY2025 GA FATAL ACCIDENTS

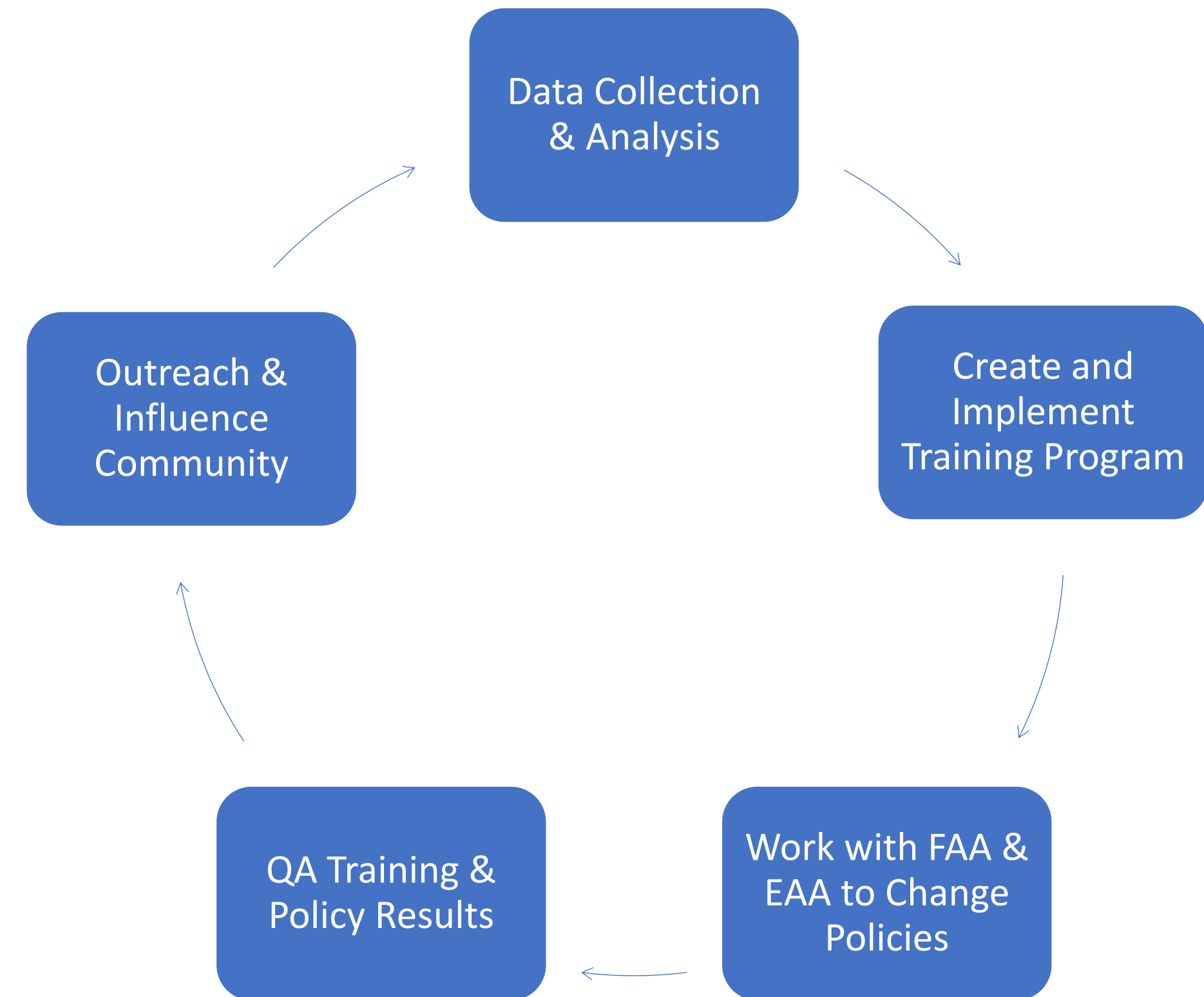
Fatal Accident Reduction Goal Targets are Rate-based on 0.92 Fatal Accidents per 100,000 Hrs and are subject to change until APO provides activity estimates for FY25

	Actual	Daily Prorated Fatal Accident Reduction Goal	Fatal Accident Reduction Goal For Month	Daily Over/Under for Month	Day of month	Total Days in Month	Fatalities
Oct	20	23	23	-3	31	31	32
Nov	7	19	19	-12	30	30	15
Dec	11	21	21	-10	31	31	12
Jan	6	15	15	-9	31	31	9
Feb	8	13	13	-5	28	28	14
Mar	9	10	17	-1	17	31	12
Apr			17				
May			26				
Jun			29				
July			30				
Aug			29				
Sep			24				
TOTAL	61	101	263	-40			94



Accident Reduction

- Collect, analyze & act on DATA
- Create training program
- Select instructors
- Train the trainers
- QA the training results
- Analyze the data
- Influence the fleet owners
- Work with EAA & FAA on other initiatives, such as:
 - AC 90-116 (Additional Pilot)
 - AC 90-89C (Task-Based flight test)
 - AC 90-109; GAJSC

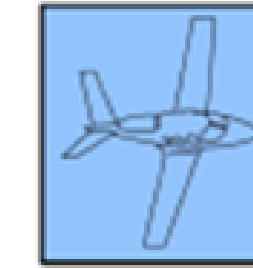


You don't know where you are going unless you know where you've been!

Analysis and Research



Available online at <http://docs.lib.purdue.edu/jate>



JATE

Journal of Aviation Technology and Engineering 5:1 (2015) 7-16

The Efficacy of Aircraft Type Club Safety

William Jeffrey “Jeff” Edwards

Saint Louis University

three aircraft type clubs and compares the safety of their members to nonmembers. A qualitative examination reveals why type club members may have a safer safety record than nonmembers.

Keywords: aircraft type clubs, safety, general aviation, general aviation aircraft accidents, efficacy of general aviation safety

Introduction

On February 2, 2012, an experimental, amateur-built Garza Lancair IV P turbine crashed on takeoff in Boise, Idaho after an uncommanded reduction in engine power, killing the pilot, Mr. Steve Appleton, CEO of Micron, Inc., a Fortune 500 company (See Figure 1). Less than ten minutes prior to the accident takeoff and crash, Mr. Appleton attempted a takeoff, and when the engine made a similar uncommanded reduction to idle, he put the aircraft back down on the runway. He then taxied back and asked the Boise tower controller for another takeoff. Engine data recovered from the accident aircraft and tower audio transcripts were used by the National Transportation Safety Board (NTSB) to reconstruct the sequence of events (National Transportation Safety Board, 2014a).

Mr. Appleton purchased the aircraft approximately one month before the accident. Several individuals recommended Mr. Appleton get type-specific training from the Lancair type club or another approved training provider. Mr. Appleton neither joined the Lancair type club nor obtained specialized training developed for the high-performance aircraft. Lack of

About the Authors

William Jeffrey “Jeff” Edwards is a doctoral student at Saint Louis University. He is an aircraft accident investigator, flight instructor, and former Navy A-6 bombardier navigator. He is founder and president of the Lancair Owners and Builders Organization. He earned his BA from Miami University and his MA from The Ohio State University. His research interest is general aviation safety. Correspondence concerning this article should be sent to vtajeff@slu.com.

Type Club Safety Research

	Total		Type Club Members				Nonmembers		
	# US Aircraft	# US Accidents	# U.S Members	% Mbrship	# Mbr Accidents	% Mbr Accidents	# US Nonmembers	# NonMbr Accidents	% NonMbr Accidents
BEECH*	14,636	49	8,842	60.4%	12	24.5%	5,794	37	75.5%
Beech Fatal Accidents		12			1	8.3%		11	91.7%
CIRRUS	4,271**	25	3,125**	73%	10	40%	1,146	15	60%
Cirrus Fatal Accidents		3			1	33.3%		2	66.7%
LANCAIR***	1,007	51	370	36.7%	8	15.7%	637	43	84.3%
Lancair Fatal Accidents		22			4	18.2%		18	81.8%

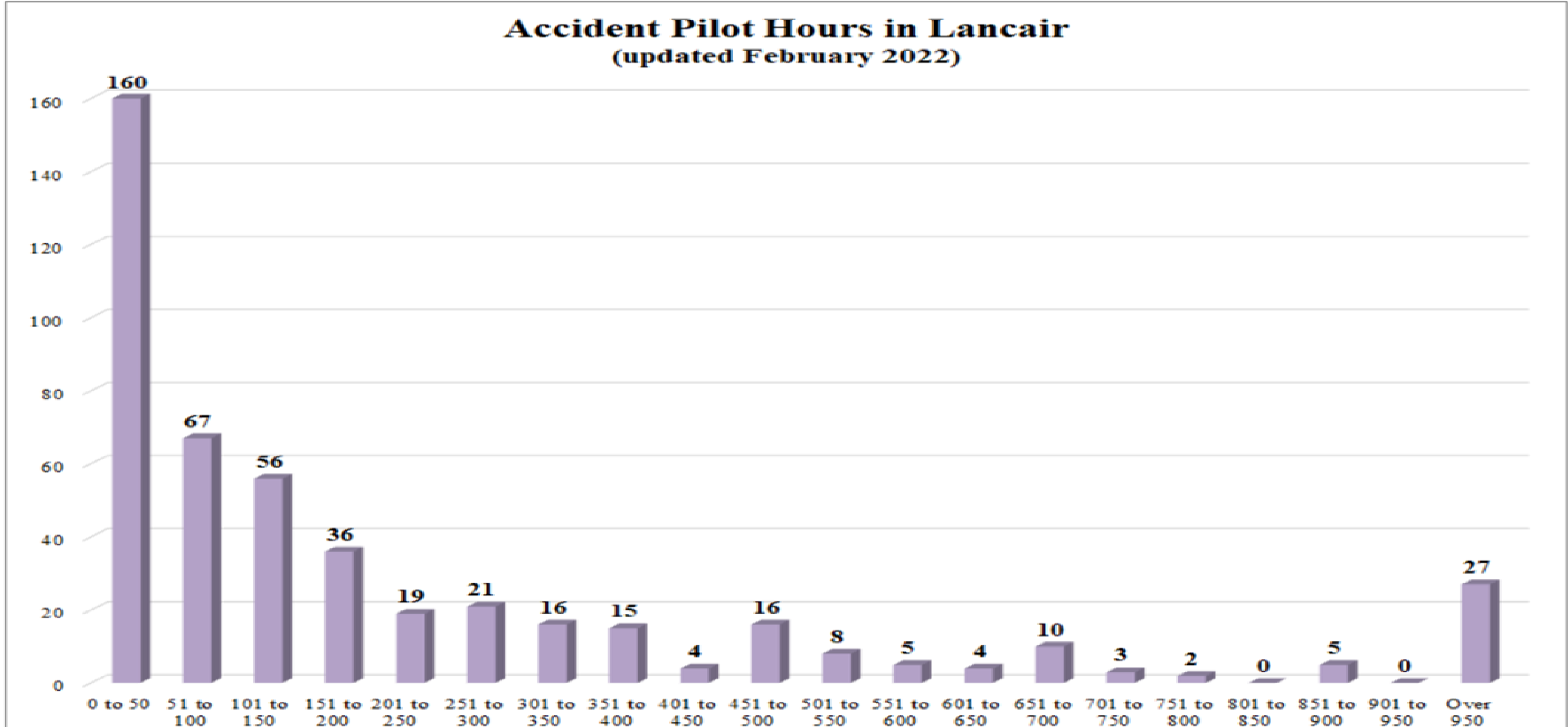
*ABS CY 2013 statistics (ABS, 2013)

**COPA Membership as of 10/3/2014; Cirrus Aircraft as of 9/29/2014 courtesy of Rick Beach, COPA

***LOBO data CY 2009–2013

Analysis

Accident Pilot Hours in Lancair
(updated February 2022)

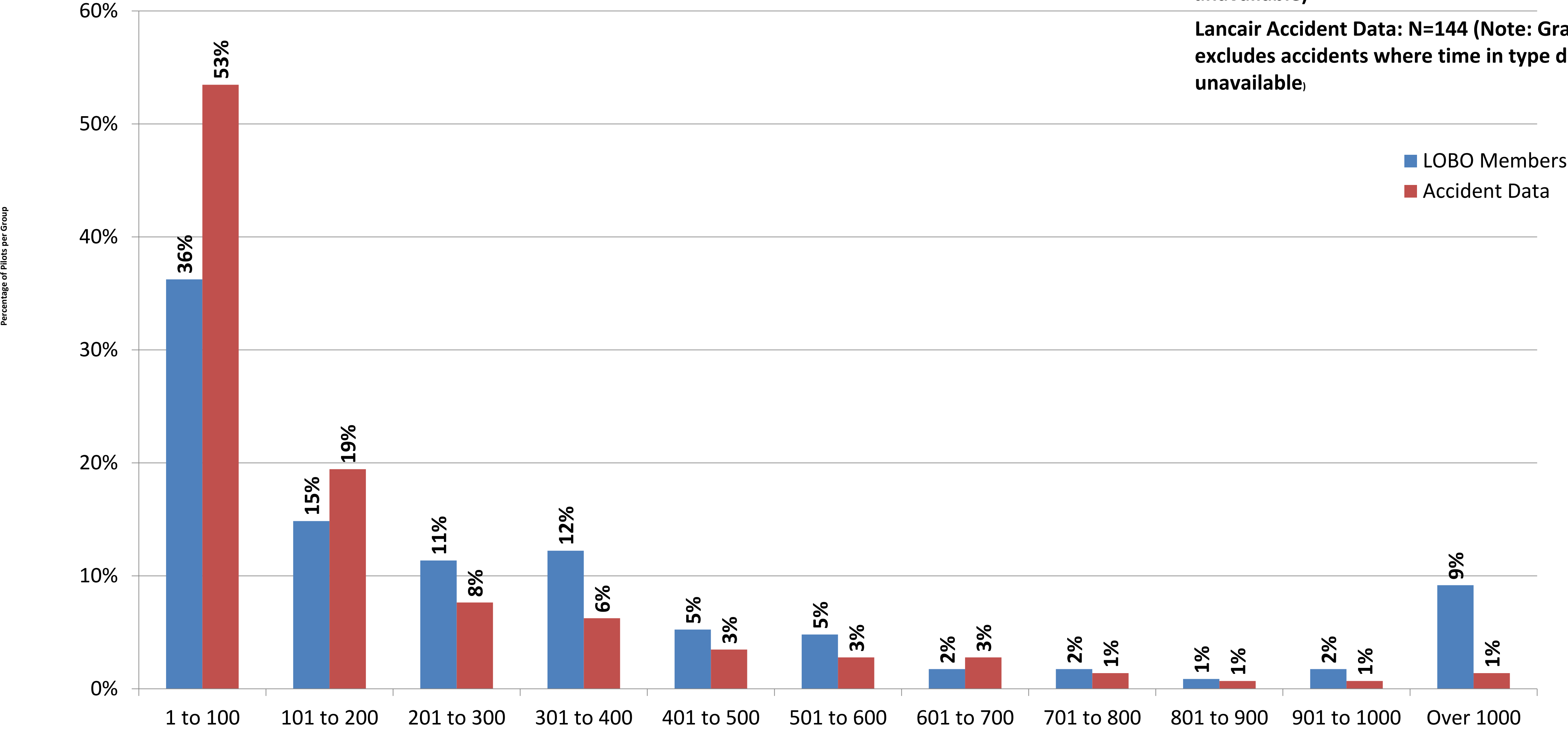


Analysis

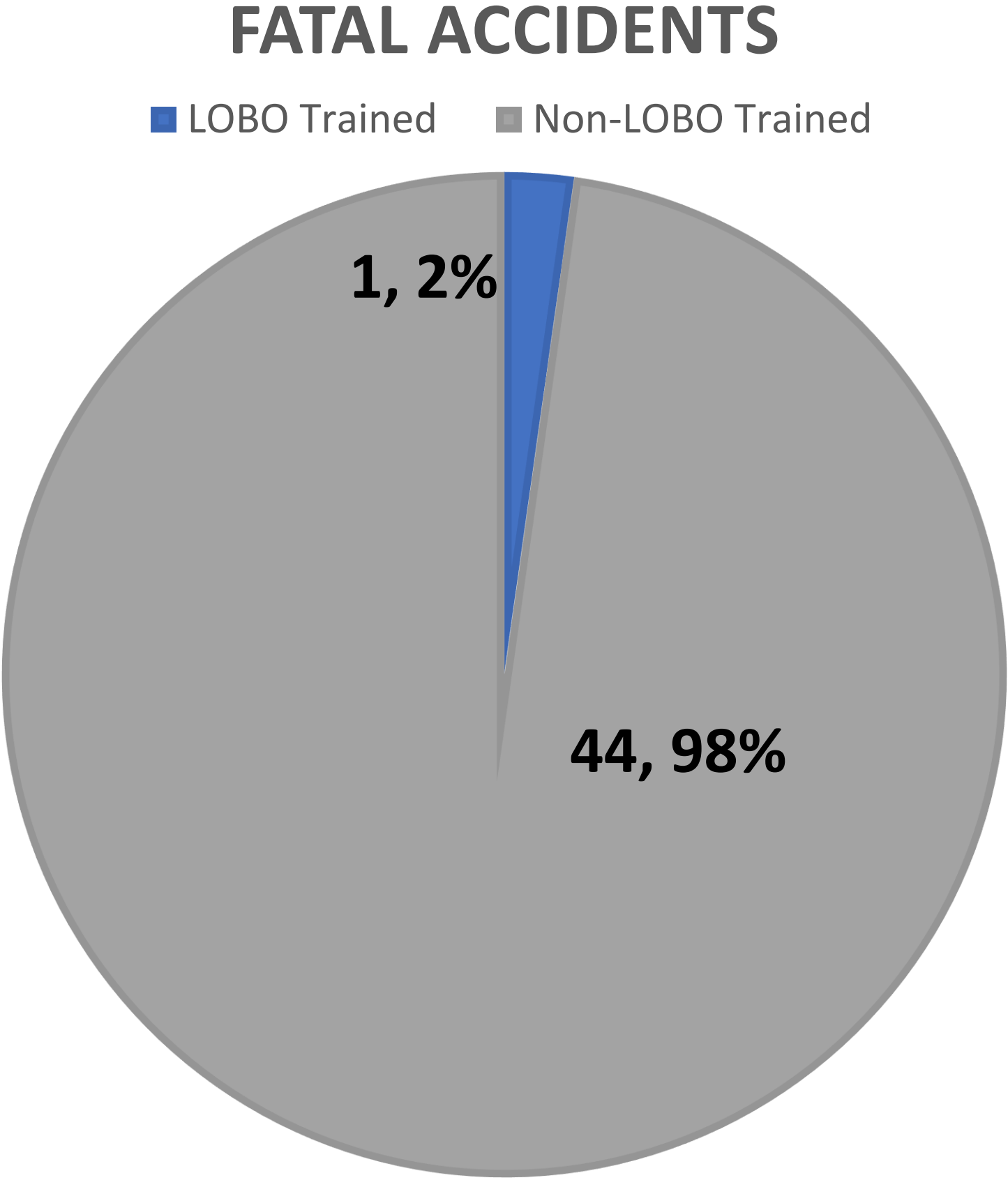
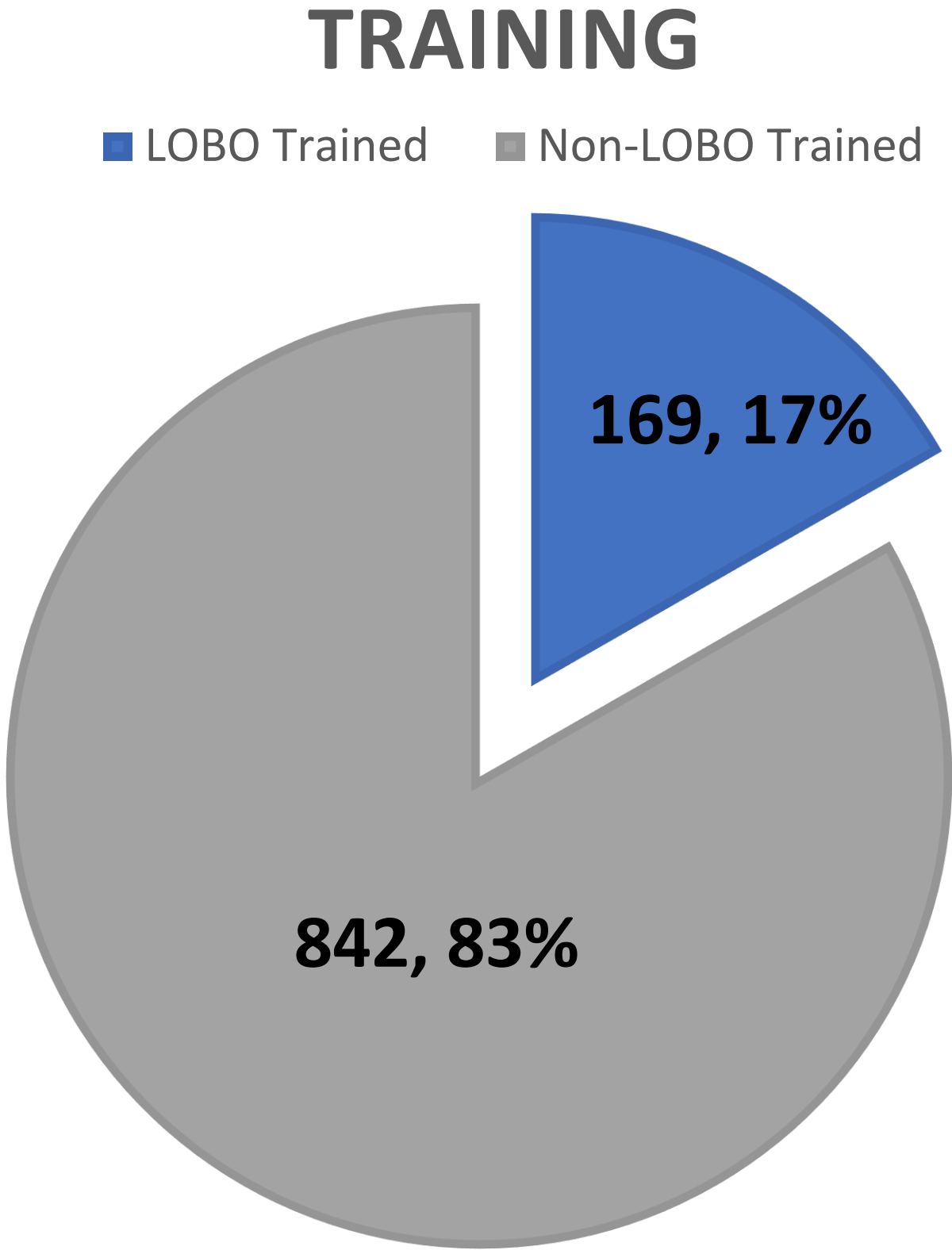
Lancair Total Hours in Type

LOBO Member Data: N=229 (Note: Graph excludes members where time in type was unavailable)

Lancair Accident Data: N=144 (Note: Graph excludes accidents where time in type data was unavailable)



Effective Training

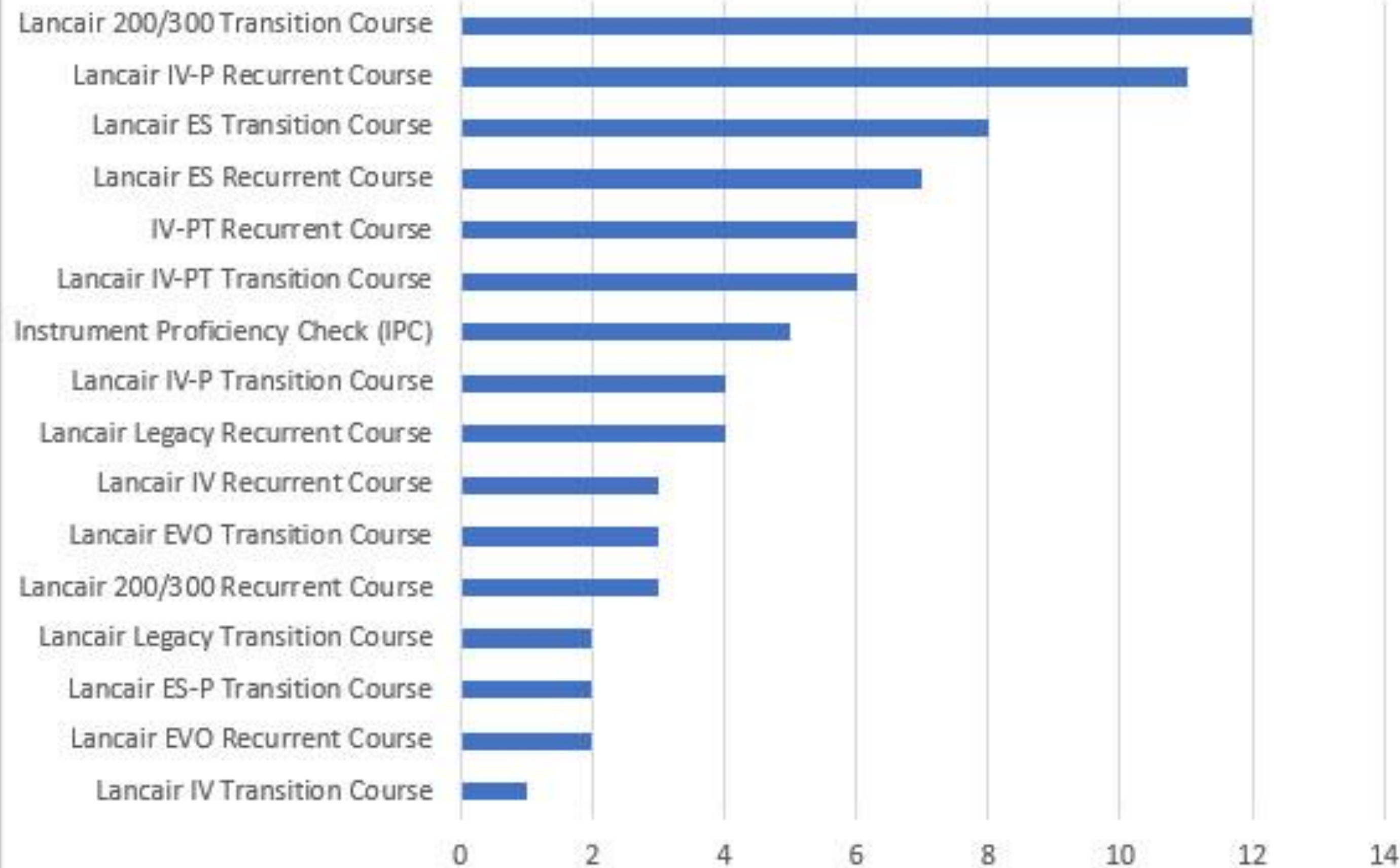


Standardized Training

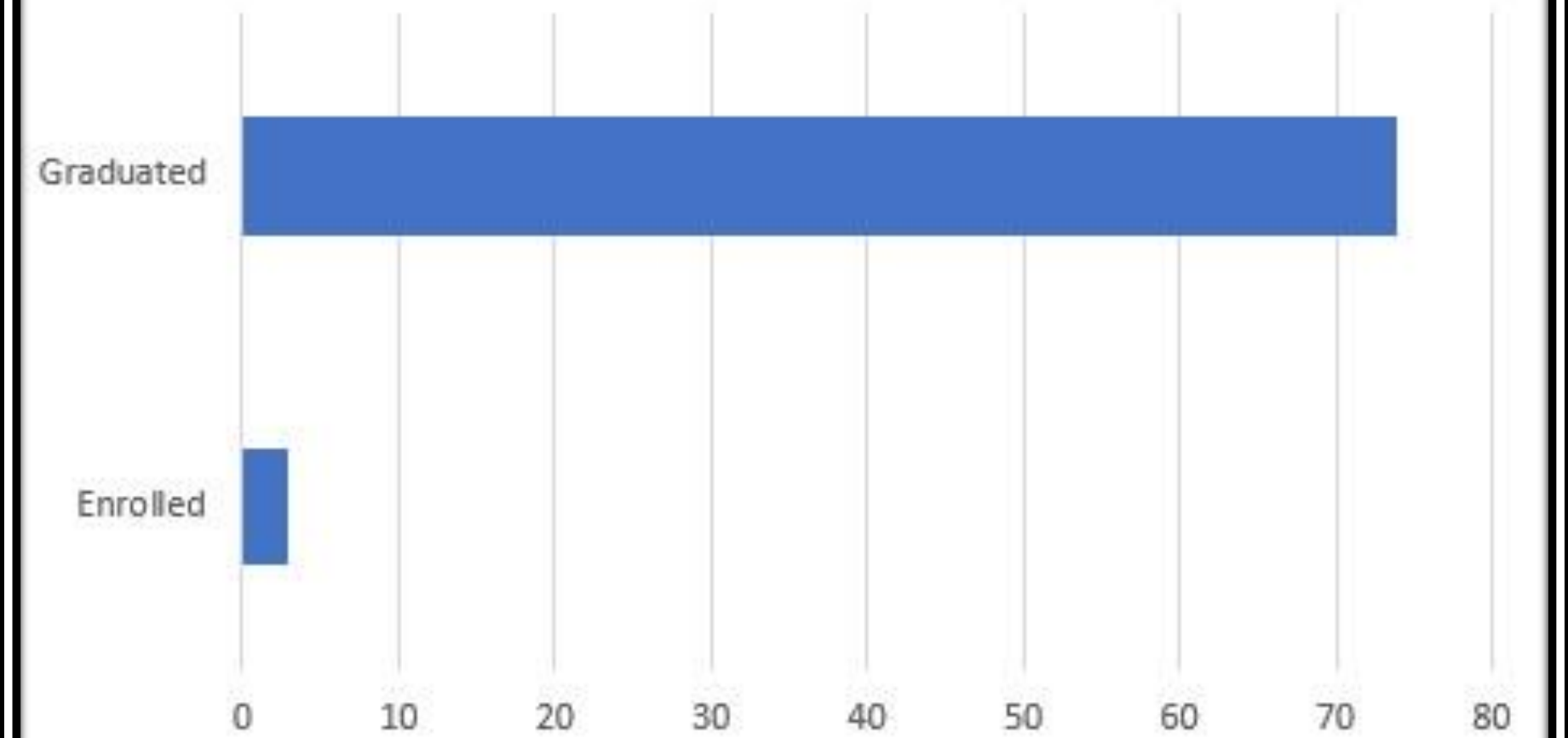


2024 Training Statistics

Count by Course



Count by Course Status



- Our highest training year participation since founding
- ~ 7 % of Lancair owners/builders undertake formal flight training

Partner

- Work with EAA, AOPA & FAA on other initiatives like:
 - AC 90-116 (Additional Pilot)
 - AC 90-89C (Task-Based flight test)
<https://meet.goto.com/865210605>
 - AC 90-109
 - Type Club Coalition
 - General Aviation Joint Safety Committee

Additional Pilot Program (APP) for flight testing experimental aircraft. The APP was developed to improve safety by enhancing Builder/Owner Pilot (BP) skills and mitigate risks associated with Phase I flight testing of aircraft built from commercially produced kits through the use of a qualified additional pilot and powerplant testing. The APP is an optional program which



U.S. Department
of Transportation
Federal Aviation
Administration

Advisory Circular

Subject: Additional Pilot Program for Phase I
Flight Test

Date: 9/23/14

AC No: 90-116

Initiated by: AFS-800 Change:



1. PURPOSE. This advisory circular (AC) provides information and guidance on the Additional Pilot Program (APP) for flight testing experimental aircraft. The APP was developed to improve safety by enhancing Builder/Owner Pilot (BP) skills and mitigate risks associated with Phase I flight testing of aircraft built from commercially produced kits through the use of a qualified additional pilot and powerplant testing. The APP is an optional program which provides another pathway to conducting Phase I flight testing. The traditional option for a pilot to test their aircraft solo during Phase I is not covered or affected by this AC, and remains an option for those who choose to do so in accordance with their aircraft's operating limitations.

2. APPLICABILITY. This AC provides information for any person who chooses to utilize an additional pilot on board in accordance with the APP described herein for a Phase I flight test.

3. RELATED CFR PARTS. Listed are the relevant Title 14 of the Code of Federal

zation

Engage Community of Owners

- Chris Zavatson – 360 Builder/Aerospace Engineer
 - [Longitudinal Stability of the Lancair 320/360 with Original and MKII Horizontal Stabilizers](#)
 - [Lancair Brake Caliper Redesign](#)
 - [Engine Cooling Improvement](#)
- Valin Thorn – Legacy Builder/Retired NASA Manager
 - [Lancair Legacy Canopy Safety](#)
- Jeff Edwards – IVP/Evolution Builder/CEO AVSafe LLC
 - [Lancair Safety Study](#)



LANCAIR OWNERS & BUILDERS ORGANIZATION

2016 LOBO White Paper – Lancair Safety

Introduction

Lancair aircraft are a family of high-performance experimental amateur-built kit airplanes. The product line ranges from the 2-seat, 100hp Lancair 200 to the 4-seat, 750shp pressurized Lancair Evolution. Design changes over the years have given each Lancair model its own unique set of handling characteristics and mechanical features. The common thread among the various Lancair models is all-composite construction and very high performance compared to certified aircraft of similar horsepower.

Safety Record

Since its founding in 2008, the Lancair Owners and Builders Organization (LOBO) has worked with insurance companies and the FAA to find solutions to Lancair fleet safety problems. Today, the fatal accident rate for Lancair aircraft is 10 per 100,000 flight hours, which is disproportionately high compared to the GA fleet (1 per 100,000 hours) and other experimental amateur-built aircraft (2 per 100,000 hours) (NTSB, 2010).

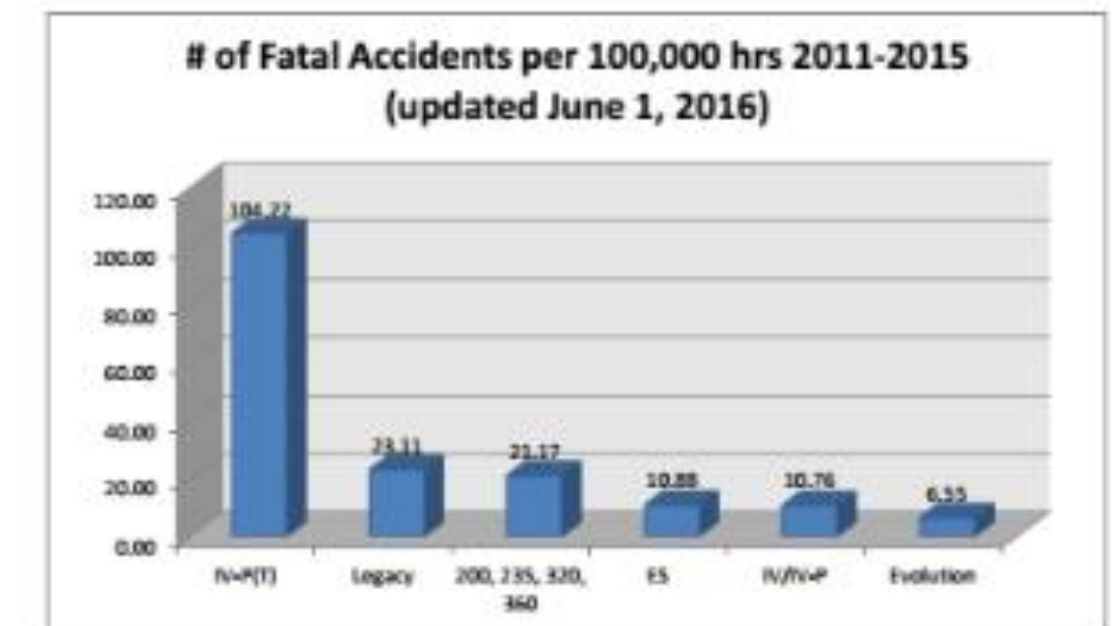
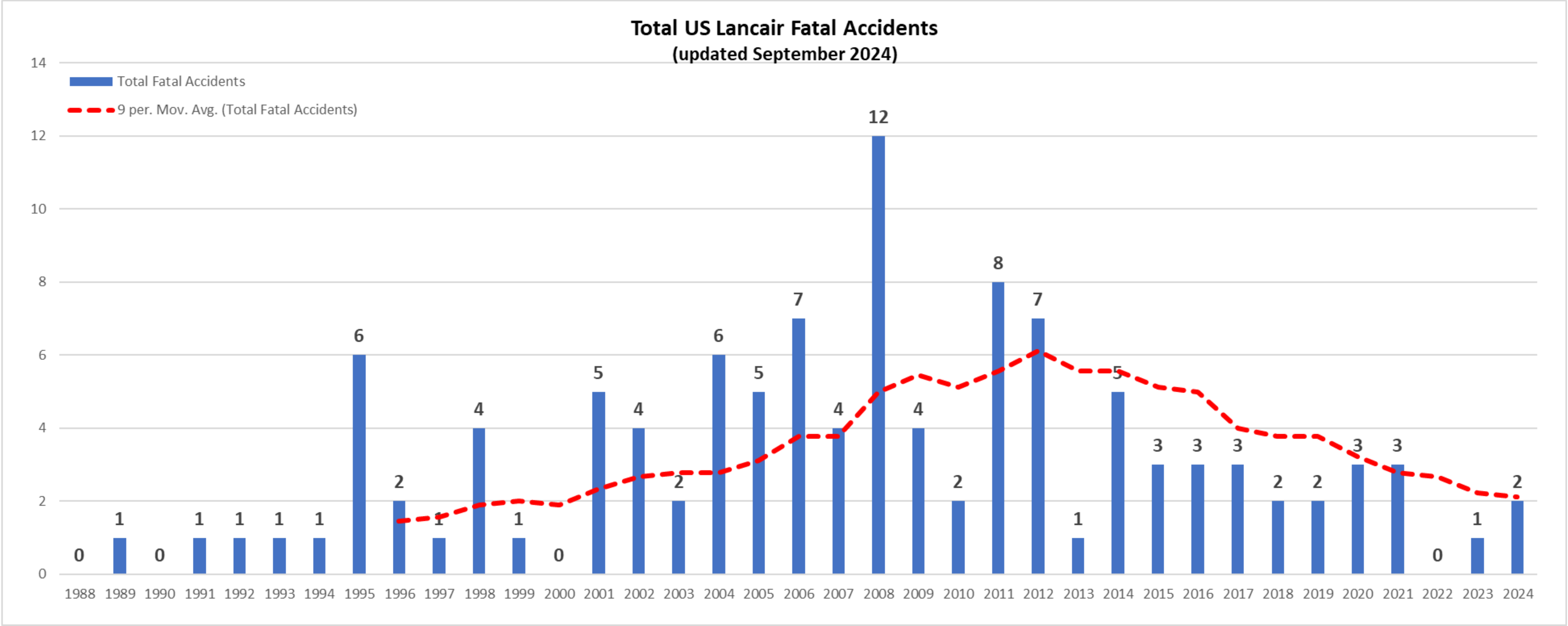


Figure 1

Results Matter!



Insurance and Older Pilots



Article

Is Declined Cognitive Function Predictive for Fatal Accidents Involving Aging Pilots?

Douglas D. Boyd ^{*} and Alan J. Stolzer ^{ID}

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* Correspondence: boydd8@erau.edu

Abstract: Background. Civil aviation comprises airlines/charters and general aviation (GA). Currently, airlines are experiencing a pilot shortage, partly reflecting scheduled retirements mandatory for airline (but not GA) pilots aged 65 years, fueling a debate as to whether the retirement age should be increased. Herein, using 16–40 years-of-age aviators as a reference, we determined whether GA pilots aged 60+ years (i) incurred an elevated accident rate, employing, for the first time, age-tiered flight time as a measure of risk exposure and (ii) carried an excess risk for cognitive deficiency-related fatal accidents. Methods. Airplane accidents (2002–2016) involving Class 3 medical certificated pilots were per the National Transportation Safety Board (NTSB) databases. Age-tiered pilot risk exposure represented a summation of flight hours per Class 3 medical applications. Cognitive decline measures were per NTSB field codes. Statistical analyses employed Chi-Square, Mann–Whitney, logistic regression, and binomial tests. Results. Using flight hours as the denominator, the fatal accident rate for older pilots (41–80 years) was unchanged compared with aviators aged 16–40 years. In the logistic regression, no cognitive deficiency measure was predictive ($p = 0.11$, $p = 0.15$) for pilots aged 61+ years who were involved in fatal accidents. Conclusion. These findings question the necessity of an automatic disqualification of air transport pilots at 65 years of age.

Keywords: general aviation; pilot; age; cognitive function; fatal accident



Citation: Boyd, D.D.; Stolzer, A.J. Is Declined Cognitive Function Predictive for Fatal Accidents Involving Aging Pilots? *Safety* **2024**, *10*, 71. <https://doi.org/10.3390/safety10030071>

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1. Introduction

Civil aviation (by definition excluding all military operations) can be largely divided into air carriers/charter operators and all others, the latter referred to as general aviation [1]. Currently, air carriers (also referred to as airlines in the common vernacular) have been experiencing a shortage of qualified pilots as a consequence of a reduction in workforce brought about by the COVID-19 pandemic [2–4]. This shortage has been further exacerbated by a wave of scheduled retirements [3] mandatory for airline pilots at 65 years of age [5] as promulgated by the International Civil Aviation Organization (ICAO) [6].

As a result, there has been a push by aviation stakeholders in the USA to increase the mandatory retirement age of airline pilots [2]. It is worth noting that, in contrast, general aviation pilots have no upper age limit after which they are disallowed from exercising their flying privileges. Indeed, some active general aviation pilots (defined as holding at least a current Class 3 medical certificate) are in their seventh [7] and eighth [8] decades of life.

However, two separate counterarguments to raising the retirement age for airline pilots beyond 65 years have been advanced. The first concern centers on earlier studies reporting higher accident rates, or pilot errors, for general aviation pilots advancing in age [9,10]. Second, the natural cognitive decline associated with the aging process has led to the debate as to whether airline pilots can operate safely, especially in the face of an unexpected event (e.g., equipment failure, weather diversion) [11]. Indeed, flying an aircraft requires “fluid” mental abilities (decision-making, sequencing of responses, solving

Basic Med



**Federal Aviation
Administration**

DOT/FAA/AM-21/18
Office of Aerospace Medicine
Washington, DC 20591

Estimated Accident Risk for BasicMed vs. Medically Certified U.S. Pilots

William Mills
Richard Greenhaw

Civil Aerospace Medical Institute
Federal Aviation Administration
Oklahoma City, Ok 73125

June 2021

Final Report



Thank You!



LANCAIR 320 RAFFLE N52WL

LOBO
LANCAIR OWNERS &
BUILDERS ORGANIZATION

TWO SEATS

G3X AVIONICS

LYCOMING ENGINE

MT PROPELLER

RETRACTABLE GEAR



- Lancair 320 RG
- Cruise 190ktas @ 10,000 ft and 9 gph
- Airframe < 150TT
- Engine < 150TSOH, IO-320-B1A
- Propeller, 3 Bladed MTV-12-C, <150 TSN

- Garmin G3X non-touch PFD/MFD
- Garmin autopilot
- Plenum installed for enhanced cooling
- Up to 10 hours of transition training included

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SCAN