An analysis of Lancair accident history was performed to evaluate the efficacy of Lancair Owners and Builder Organization (LOBO) flight training. LOBO flight training was instituted in early 2009 following the formation of LOBO as a type club for the Lancair community. In early 2009 a FAA/ Industry Training Standards (FITS) scenario-based syllabus was developed by LOBO and was submitted to the FITS team for peer review and approval. Approval from FITS was gained in Q1 2009 and training commenced using the LOBO syllabus shortly after that.

The LOBO syllabus is a scenario-based training program that incorporates initial transition for pilots new to the fleet and recurrent training for pilots currently flying Lancair aircraft. The syllabus states, “This Lancair initial transition flight training syllabus is based on modern FAA/Industry Training Standards (FITS) that train to proficiency utilizing scenario-based training modules as well as classic maneuver-based training. Sound aeronautical decision making, single pilot resource management and risk management is emphasized throughout this program. This training syllabus provides initial flight and ground transition training for a pilot who has no prior Lancair experience. This training prepares a proficient certificated pilot to fly the Lancair series aircraft. It does not teach basic flying skills. This course is designed to be completed in four to five days. Completion is dependent on pilot proficiency and prior experience in flying complex, high‐performance aircraft, the application of sound ADM and completion of prerequisite training material. The course is comprised of approximately 12 hours of ground training over three lessons, and 12 hours of flight training over six lessons. All training times are estimated as the factors determining the total required training time (pilot knowledge, skill and preparation) cannot be determined prior to the start of training. This training program teaches normal as well as emergency procedures with an emphasis on sound aeronautical decision making.”(Edwards, 2009) The training includes instrument proficiency training to FAA IPC standards for instrument rated pilots. There is also a heavy emphasis on engine out emergency practice that addresses shortfalls in FAA private pilot training and the significant losses in the Lancair community associated with a loss of power. Since Q1 2009 LOBO approved instructors have performed two hundred and forty (240) separate training events with one hundred and twenty-seven (127) individuals.

This research examined Lancair accidents from 2009 through 2021 and compares pilots who received LOBO training to pilots who did not receive LOBO training. These accidents do not include foreign accidents, foreign registered aircraft, events that occurred while racing in sanctioned events, nor events that are classified as incidents under the FAA definitions.

The hypotheses for this quantitative study are:

1. The null hypothesis Ho = there are no differences in accident rates between LOBO trained pilots and non-LOBO trained pilots.
2. The alternative hypothesis Ha = there are differences in accident rates between LOBO trained pilots and non-LOBO trained pilots.

Analysis comparing LOBO training to the date of accident and date of training was performed. Since the inception of the LOBO training program there have been one hundred and two (102) defined NTSB accidents involving experimental amateur built Lancair aircraft. Forty-three of these were fatal accidents with sixty-four fatalities. There have been no fatal accidents involving a LOBO trained pilot.

Twelve (12) LOBO trained pilots experienced accidents or incidents following their training. Eight (8) LOBO trained pilots were involved in defined NTSB accidents with two (2) receiving training AFTER the accident and six (6) getting LOBO training prior to the accident. Seven (7) pilots had engine failures with successful outcomes as noted below. Six (6) of those pilots had received training within twelve months of the accident or incident. Four (4) pilots experienced engine failures at altitude with two landing on a runway and two executing successful landings off-airports with no serious injuries. Three (3) pilots experienced engine failures at low altitude after takeoff or in the traffic pattern with their positive outcomes later attributed by the pilots to be the RESULT of their recent LOBO training. One pilot experienced a windshield failure while flying in the flight levels two months after LOBO training and successfully landed the aircraft with no serious injuries, again attributing his LOBO training to his successful outcome. LOBO trained pilots have experienced better outcomes when a serious emergency occurred.

A two tailed Z test was performed to determine if there is a significant difference between the LOBO trained pilot population and the non-LOBO trained pilot population with regard to overall accidents.

Six (P1) of 127 (N1) LOBO trained pilots had an accident after training. Ninety-six (P2) of 884 (N2) non-LOBO trained pilots had accidents.

The z score is -2.146 where p is .03156 and is significant at p<.05

A two tailed Z test was performed to determine if there is a significant difference between the trained pilot population and the non-trained pilot population with regard to fatal accidents.

Zero (P1) of 127 (N1) LOBO trained pilots had a fatal accident after training. Forty-three (P2) of 884 (N2) non-LOBO trained pilots had fatal accidents.

The value of z is -2.5401. The value of p is .01108. The result is significant at p < .05.

There are 1011 Lancairs total fleet size

There were 127 LOBO trained pilots involved in 6 accidents vice 884 non-LOBO trained pilots involved in 102 accidents.

4.7% of the LOBO trained pilots have had an accident

0.0% of the LOBO trained pilots have had a fatal accident.

10.8% of the non-LOBO trained pilots have had an accident.

4.8% of the non-LOBO trained pilots have had a fatal accident.

LOBO trained pilots are at a significantly lower risk of having a fatal accident than non-LOBO trained pilots. LOBO trained pilots are at a significantly lower risk of having a non-fatal accident than non-LOBO trained pilots.