

Report on the Effectiveness of the *WINGS* – Pilot Proficiency Program



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Introduction

There have now been three full calendar years of activity with the automated **WINGS** – Pilot Proficiency Program: 2008, 2009, and 2010. As a consequence of the significant changes made to the **WINGS** Program in May 2007, there have been many inquiries from interested parties, including insurance companies, flight schools, the National Association of Flight Instructors (NAFI), the Society of Aviation and Flight Educators (SAFE), and the Aircraft Owners and Pilots Association (AOPA), about the new program's effectiveness. In addition, numerous FAASTeam Program Managers and FAASTeam Representatives have expressed ongoing interest in the answer to that question.

While it at first appears to be a simple process of comparing the **WINGS** database against the FAA accident database, it is not that simple. After reviewing the FAA data on 14 CFR part 91 accidents, which we received from the FAA Data Analysis Branch, we discovered some anomalies in that data, described below. In addition, to ensure this report contains meaningful information, we made decisions about accidents that would not be included in the analysis.

Because the **WINGS** Program, and the primary FAASTeam emphasis, is concerned with General Aviation, we included only accidents that were operating under 14 CFR part 91. We therefore excluded all commercial flights, e.g., those operating under 14 CFR parts 121, 125, 129, 133, 135, and 137. After consideration, we also excluded flights that were identified as operating under 14 CFR part 141, inasmuch as the pilot-in-command was either a solo student or an airman who was acting as a flight instructor and not exercising his or her pilot certificate at the time of the accident.

In addition, we decided to exclude certain accidents from the study. First, we excluded all accidents where an airman who was a mechanic was the sole manipulator of the controls. Second, we excluded all accidents where the pilot-in-command was a student pilot flying solo. Third, we excluded all accidents where the NTSB found that a student pilot was flying and the flight instructor failed to intervene in a timely manner to avoid the accident. We also discovered that in about 4% of the accidents reported by the FAA, there was insufficient data to positively identify the pilot-in-command. Therefore, these accidents were excluded.

Furthermore, we included only accidents where the pilot-in-command was a U.S.-certificated pilot and where the aircraft was a U.S.-registered aircraft. Additionally, a small number of accidents were determined by the NTSB to have been solely the fault of a maintenance cause; these accidents were not included in this study.

While it would have been nice to know the number of active General Aviation pilots so that a comparison of some kind could be made, we discovered no meaningful method to determine that number. It should also be pointed out that it was beyond the scope of this study to determine whether it is a pilot's participation in the **WINGS** Program in and of itself that raises their level of awareness toward risk management, or if the pilots who participate in the **WINGS** Program already have an effective safety attitude and their participation in the **WINGS** Program is a natural result of that attitude.

Accident Data

In 2008, referring only to flights operated under 14 CFR part 91, the FAA Data Analysis Branch reported 257 fatal accidents and 1,190 non-fatal accidents. After making the exclusions noted above, the study included 239 fatal accidents (93% of the total reported) and 1,050 non-fatal accidents (88% of the total reported).

In 2009, there were 275 fatal accidents reported and 1,054 non-fatal accidents. After making the exclusions noted above, the study included 238 fatal accidents (87% of the total reported) and 935 non-fatal accidents (89% of the total reported).

In 2010, there were 268 fatal accidents reported and 1,047 non-fatal accidents. Again, after making the exclusions noted above, the study included 235 fatal accidents (88% of the total reported) and 1,047 non-fatal accidents (91% of the total reported).

A summary for the three years is shown in the chart below.

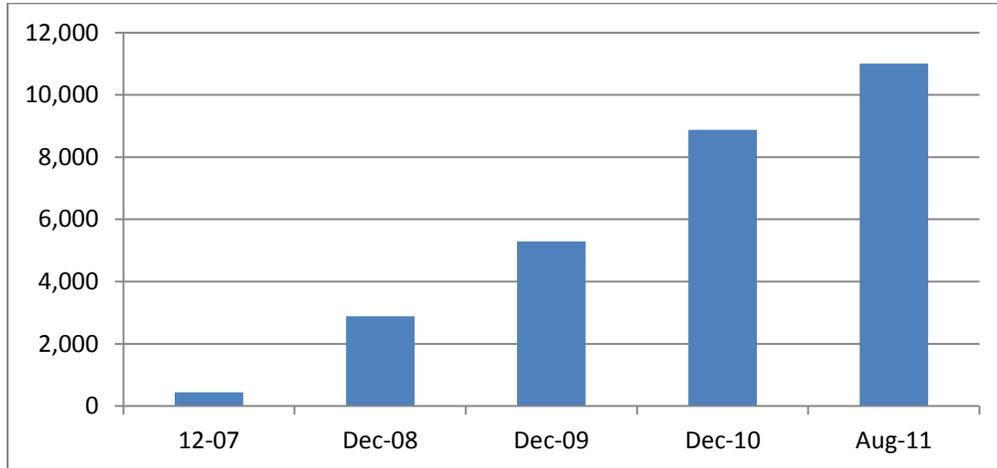
Accident Type	Part 91 Accidents Reported	Part 91 Accidents used in Analysis	Percent of Part 91 Accidents used in Analysis
Fatal	800	712	89.0%
Non-Fatal	3,291	2,942	89.4%
Total	4,091	3,654	89.3%

WINGS – Pilot Proficiency Program

The **WINGS** Program was re-invented in May 2007, with two major changes. First, the program was moved from a paper-based program administered at individual FSDOs to an automated program administered nationally on www.FAASafety.gov. Second, the program was changed from an award program based on time involvement to a proficiency program substantially based on a demonstration of pilot knowledge and skills.

At the end of December 2008, 2,881 pilots had earned a phase of **WINGS** in the new program. This was not considered a very good start. After a review, it was determined that the revised **WINGS** program itself was not the real problem. On the other hand, the introduction and advertising of the program was not handled very well, and led to much discontent. In addition, the interface on FAASafety.gov was not very user friendly.

Significant changes were made to the web-based system starting in 2009 and continuing into 2010, such that at the end of December 2010, 8,878 pilots had earned a phase of **WINGS**. Since then, additional incremental changes have been made so that on September 15, 2011, more than 11,000 pilots have earned a phase of **WINGS**.



In our study, we compared the accidents referred to above with the pilots participating in the **WINGS** Program and determined which pilots had earned a Phase of **WINGS** at the time of their accidents.

Methodology

The methodology used in our analysis was simple and direct. The certificate numbers of the pilots involved in the 3,654 accidents included in the study were compared against the certificate numbers of pilots who had participated in the **WINGS** program for the three years of the study – 2008, 2009, and 2010.

If a match was found, the result was reported on a spreadsheet with the accident data and the **WINGS** data. We then determined if the pilot had earned a phase of **WINGS** before the accident, and whether it was current at the time of the accident.

Results

Of the 3,654 pilots who had an accident during the three years of the study, 25 pilots were determined to have earned a phase of **WINGS** before the date of the accident. The 25 pilots represent 0.68% of the total number of pilots involved in an accident during that time period. The astute observer will note that the percentage increased each of the subsequent years. This is not unexpected since the number of **WINGS** participants increased at a much higher rate each year, (84% from 2008 to 2009, and 68% from 2009 to 2010) thereby including more pilots each year.

Calendar Year	Number of part 91 accidents	Number of Pilots who earned a phase of WINGS before the accident	Percentage of Pilots who earned a phase of WINGS before the accident
2008	1,289	5	0.39%
2009	1,173	7	0.60%
2010	1,192	13	1.09%
Total	3,654	25	0.68%

We determined that of those 25 pilots, only 12 had a “current” phase of **WINGS** at the time of the accident. (A “current” phase is defined as having been earned within the preceding 12 calendar months.) Those 12 represent 0.33% of the total pilots who had an accident. Note, the percentage decreased each subsequent year, at the same time the number of participating pilots increased.

Calendar Year	Number of part 91 accidents	Number of Pilots who had an accident who also had a “current” phase of WINGS before the accident	Percentage of Pilots who had an accident who also had a “current” phase of WINGS before the accident
2008	1,289	5	0.39%
2009	1,173	4	0.34%
2010	1,192	3	0.25%
Total	3,654	12	0.33%

Furthermore, those 25 pilots who had earned a phase of **WINGS** before their accident represent 0.28% of the 8,878 pilots who had ever earned a phase of **WINGS** through December 31, 2010.

At the end of the calendar year	Pilots who Earned a Basic Level Phase Ever	Number of Pilots who earned a Phase of WINGS and Had an Accident	Percentage of Pilots who earned a Phase of WINGS and Had an accident
2008	2,881	5	0.17%
2009	5,290	12	0.23%
2010	8,878	25	0.28%

The numbers are even more compelling when we look at the 712 fatal 14 CFR part 91 accidents reviewed in the study. There were only four pilots who had earned a phase of **WINGS** before their accidents. This represents only 0.56% of the fatal accidents over those years. Furthermore, only one of those pilots (0.14%) had a current phase of WINGS at the time of the accident.

Calendar Year	Number of Fatal Part 91 Accidents	Number of Pilots who earned a Phase of WINGS before the accident	Percentage of Pilots who earned a Phase of WINGS before the accident	Number of Pilots who had a "Current" Phase of WINGS before the accident	Percentage of Pilots who had a "Current" Phase of WINGS before the accident
2008	239	0	0.00%	0	0.00%
2009	238	2	0.84%	1	0.42%
2010	235	2	0.85%	0	0.00%
Total	712	4	0.56%	1	0.14%

Review of the Accidents by **WINGS** Pilots

A review of the 25 accidents suffered by **WINGS** pilots revealed the following.

Ten accidents were classified as Loss of Control accidents. Of these, four were accidents involving low-time tail-wheel pilots — three on landing and one on takeoff. Three were accidents involving water landings by low-time seaplane pilots. There was one additional takeoff accident and one additional landing accident. There was also an accident that resulted from spatial disorientation in the traffic pattern.

Five accidents were the result of engine failure. In the opinion of the author, each of these accidents was completely preventable. Three resulted from fuel exhaustion due to poor pre-flight planning. One was the result of carburetor icing when a pilot departed after receiving a weather briefing that stated that “carburetor icing was possible at all altitudes.” One resulted from water in the fuel tanks of an airplane that had sat outside open to the elements for many years. The NTSB report referred to “a poor preflight inspection.”

The other ten accidents were the result of a potpourri of causes. One pilot hit a deer on a night takeoff at a field without a complete fence. One pilot forgot to lower his landing gear. One was because a pilot was new to night flying and landed too fast and ran off the end of the runway. Another pilot loaded an airplane to gross weight at a high-density-altitude airport and hit the approach lights on takeoff. One was a glider malfunction on a towed takeoff. One was a pipeline patrol accident at low altitude. There were two VFR flights into IMC conditions. And, finally, two pilots in helicopters lost control during flight.

Observations and Recommendations

The first observation is that pilots who participate in the **WINGS** Program and earn a phase of **WINGS** have a very low incidence of accidents. This is not unexpected since recurrent training has consistently proven to be an effective means of maintaining pilot proficiency.

The second observation is that the study shows that pilots who maintain a “current” phase of **WINGS** have even fewer accidents. Again, the theme of recurrent training is evident. In addition, we suspect that the principle of “Recency” from the Laws of Learning discussed in the *Aviation Instructor’s Handbook* plays a strong role when a pilot participates regularly in the **WINGS** Program.

Based on a review of the **WINGS** participants’ accidents, flight and ground instructors should give more attention in two major areas. In addition, designated pilot examiners should test more thoroughly in the second area, which will emphasize that topic’s importance. The areas are:

1. Transition training
2. Proper preflight planning, with an emphasis on performance and limitations

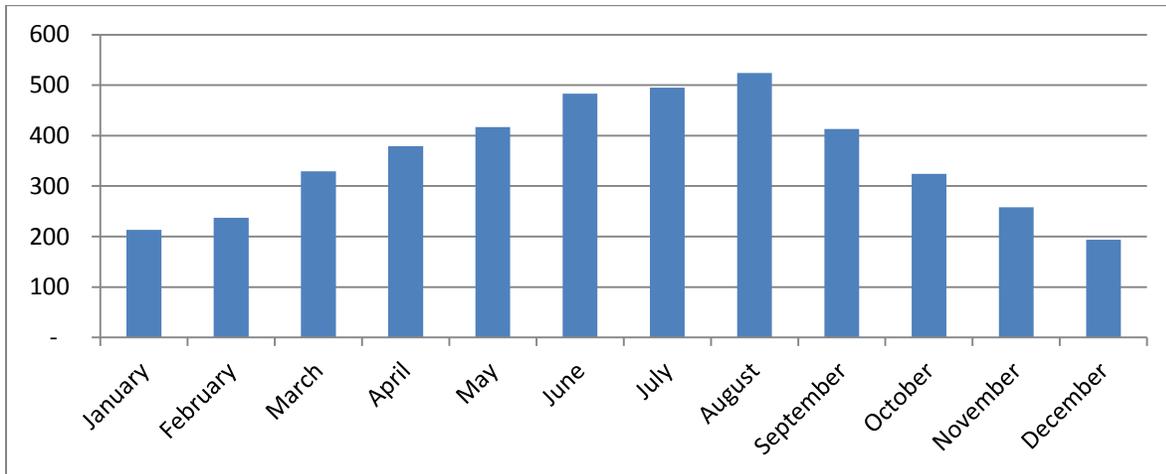
Yet, the most important finding from this review of the data is that more General Aviation pilots should participate in the **WINGS** Program! Willing participation in the **WINGS** Program will have the greatest positive impact on reducing the number of General Aviation accidents.

An Additional Observation

Although we did not explore further the implications shown in the following chart, we felt we would be remiss if we did not point out the effects of seasonal variation on the number of General Aviation accidents. The chart vividly points out that pilots should exercise more care at the beginning of the General Aviation flying season and throughout the summer.

One way to do that is to participate in the **WINGS** – Pilot Proficiency Program – designed to address primary accident causal factors and provide mitigation strategies for avoiding accidents. As determined by this study, those accident causal factors are:

1. Knowledge - Aeronautical Decision Making
2. Knowledge - Performance and Limitations
3. Knowledge - Preflight Planning, Risk Management, and Fuel Management
4. Flight - Takeoffs and Landings
5. Flight - Positive Aircraft Control
6. Flight - Basic Flying Skills



Note: The chart shows all part 91 accidents, as classified by the National Transportation Board (NTSB), for the years 2008, 2009, and 2010.