SOARING SAFETY FOUNDATION

Nov 1, 2010 – Oct 31, 2011

SAFETY REPORT

SOARING SAFETY FOUNDATION

PREFACE

In 1985 the Soaring Society of America (SSA) formally created the Soaring Safety Foundation (SSF). The SSF was tasked with 2 major objectives, (1) to develop methods and techniques that would promote soaring safety in the United States; and (2) review and disseminate flight training information and material. These tasks had previously been performed by several subcommittees of the SSA Board of Directors. The creation of the SSF allowed these tasks to be focused in a single organization whose main mission is the promotion of soaring safety.

Accident data included in this report was obtained from two primary sources: the National Transportation Safety Board (NTSB) accident reports (http://www.ntsb.gov/ntsb/query.asp) and the Federal Aviation Administration (FAA) daily reporting system. These sources were selected because of the specific reporting requirements specified in the Code of Federal Regulations NTSB Part 830. Although it would be ideal to include all accident and incident reports involving gliders, it becomes extremely difficult to confirm accurate reporting from the various entities involved. Consequently, the SSF elected to take advantage of the standardized reporting requirements of NTSB Part 830 to develop its data base of soaring accident information. This data base is then used to develop accident prevention strategies and to continuously improve training methods to reduce the number of soaring accidents.

The information contained in this report represents data compiled by the SSF and reported in **Soaring** Magazine, Flight Instructor Refresher Clinics, at pilot safety seminars, and on the **SSF web site (http://www.soaringsafety.org)**.

Funding for the SSF is obtained through donations from individuals and organizations interested in the promotion of soaring safety. These funds are then used to develop and promote programs such as soaring safety seminars, flight instructor refresher clinics, posters, safety-related articles in *Soaring* Magazine, the SSF web site, and the newsletter of the SSF, *Sailplane Safety*. The Trustees of the Soaring Safety Foundation sincerely hope that this report and the publication of accident data are beneficial in assisting members of the soaring community in developing a greater awareness of current issues and emerging trends in soaring safety.

Additional copies of this report may be obtained from the Soaring Safety Foundation web site http://www.soaringsafety.org. Select the “Accident Prevention – SSF Reports” tab or write to:

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EXECUTIVE SUMMARY

This report covers the FY11 (November 1, 2010 to October 31, 2011) reporting period. A review of the NTSB accident database shows a 15.6% decrease in the number of US soaring accidents during this time period compared to the FY10 reporting period. However FY11 saw a 66.7% increase in the number of fatal accidents. In addition, in early August 2011 the SSA was informed of a large increase in the number of accidents and incidents reported to the insurance company. While this report does not typically report insurance claims, the report of 1 claim per day in July cannot be ignored.

The large number of fatal accidents, and the increase in insurance claims lead the SSF and SSA to issue a special safety notice to the entire SSA membership. The SSF and SSF are also followed up this letter with a special 2 hour session during the SSA convention in Reno NV. The outcome of this meeting was a dialog between SSA members on ways they can improve the safety culture of every soaring operation in the country. This report carries a summary of that safety session and interested parties should check the SSA and SSF web sites for more information as it becomes available.

For the twelve-month period ending October 31, 2011, twenty-four (24) gliders, two (2) motorgliders, and one (1) towplane were involved in twenty-seven (27) separate accidents meeting the reporting requirements of NTSB Part 830 of the Code of Federal Regulation. This represents a 15.6% decrease in the number of accidents reported during the FY10 reporting period. The five-year average for the FY07 – FY11 reporting period is 33.0 accidents per year, representing a 4.6% decrease in the average number of accidents from the previous five-year period.

While the average number of accidents per year has shown a steady decline since 1981 (averaging 45.6/year in the 80’s, 38.6/year in the 90’s and 33.3/year in the 00’s) the number of accidents each year remains too high. In addition, the average number of fatalities has remained nearly constant, at just over 6 per year since the mid 1990’s. In the FY11 reporting period ten (10) accidents resulted in fatal injuries to ten (10) pilots and passengers. In addition, four (4) pilots and two (2) passengers received serious injuries while twenty-three (23) pilots and six (6) passengers received minor or no injuries during the FY11 reporting period.

A review of the ten (10) accidents fatal accidents showed that five (5) accidents occurred during the launch phase of flight, three (3) gliders were in cruise flight, one (1) motorglider crashed while making an off-airport landing, and one (1) glider crashed in mountainous terrain for unknown reasons. There were no mid-air collisions reported during the FY11 period, down from a record of four (4) in the previous reporting period. It should also be noted that ALL (100%) of the PT3 accidents resulted in fatal injuries to one person (tow-pilot, glider pilot, or passenger) involved in the accident. All fatal accidents are still under investigation by the NTSB, more details are given in the main report.

Continuing a long historical trend, the largest number of accidents occurred during the landing phase of flight during this reporting period. In FY11 landing accidents represented 59.3% of all accidents. It should also be noted that nine (9) of the sixteen (16) landing accidents, or 56%, occurred while the pilot was attempting an off-field landing. The remaining seven (7) accidents occurred while the pilot was attempting to land on their home airport. It should also be noted that three (3) of these on-airport landing accidents occurred while a CFIG was on-board providing instruction. Causes of these accidents include; the pilot exercised poor judgment by attempting to perform a low-altitude pass, flight over unlandable terrain in an attempt to complete a contest flight, and misjudged the approach due to improper use of the flight controls.

To address the landing accidents, the SSF continues to promoting that pilots and instructors adopt a ‘goal oriented approach’ to pattern planning and execution. The ‘goal’ is to arrive at your selected landing spot, so that you can stop at a pre-determined point. In this approach, pilot continuously evaluates the gliders flight path taking into account wind speed/direction, lift/sink, distance remaining to the landing spot, and the height above the landing spot. The key to accomplishing this approach is to recognize that while most pilots have difficulty picking out a specific angle, every pilot is adept at recognizing changes in angles. Responding to the slightest change, by making small changes in the gliders flight path or sink rate, will help the pilot remain on the intended glide path to the landing spot. This increases the pilot’s chances of successfully dealing with unexpected conditions throughout the landing phase of flight.

Instructors should also consider the use of hand-held GPS based flight recorders to capture the landing profile of the glider. The student’s flights can be displayed on the computer and used as an aid in critiquing the student’s performance. Students can also be encouraged to download flight traces off the Internet, i.e., the OLC web site contains thousands, and these traces can be used to show how other pilots solve this challenging flight maneuver.

Aborted launch accident, called PT3 (Premature Termination of The Tow) events, accounted for 18.5% of the FY11 accidents. Four (4) of these accidents involved the glider being aerotowed while the remaining accident involved a glider conducting an auto-tow. Pilots can, and should, mentally prepare for a failed launch by developing a specific set of action plans to deal with several contingencies. The task is then to execute the proper plan at the proper time. Flight instructors should continue to emphasize launch emergencies during flight reviews, club check rides and flight training.

Two (2) motor-gliders, both Pipistrel's, were involved in two (2) landing accidents in the FY11 reporting period. One accident was an off-airport landing, while the other occurred when the aircraft ground looped during a cross-wind landing.   Motor-glider pilots must consider the possibility that the engine will fail to start or may not continue to operate after it has started. A suitable landing site must be kept within range anytime the engine is operating.

Flight instructors play an important safety role during everyday glider operations. They need to supervise flying activities and serve as critics to any operation that is potentially unsafe. Their main job is to provide the foundation upon which a strong safety culture can be built. Other pilots and people involved with the ground and flying activates also need to be trained to recognize and properly respond to any safety issues during the daily activity. Everyone, students, pilots, ground operations, and instructors, should continuously evaluate both ground and flight operations at US chapters, clubs, commercial operations and at contests. An operations safety culture should encourage anyone to raise safety issues with fellow pilots, club officers, and instructors. By addressing issues before they become accidents, we can improve soaring safety. Only by the combined efforts of ALL pilots can we reduce the number if accidents.

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ANNUAL SAFETY REPORT
FY 11

This report covers the FY11 (November 1, 2010 to October 31, 2011) reporting period. A review of the NTSB accident database shows a 15.6% decrease in the number of US soaring accidents during this time period compared to the FY10 reporting period. However FY11 saw a 66.7% increase in the number of fatal accidents. In addition, in early August 2011 the SSA was informed of a large increase in the number of accidents and incidents reported to the insurance company. While this report does not typically report insurance claims, the report of 1 claim per day in July cannot be ignored.

For many reasons[1], this report represents an incomplete view of the accidents involving US glider pilots. This is especially true this year as the number of accidents/claims reported to the insurance company is far greater than the number of accidents reported to the NTSB. Despite these limitations, this annual report is published to highlight some of the glider accidents listed in the NTSB aviation accident database. Examination of these accidents can help point out trends and issues that need to be resolved. Safety is everyone's business, every pilot must continuously evaluate their flying skills, proficiency, and decision making skills to ensure every flight ends with a safe arrival at the intended point of landing.

Number of Accidents since 1981

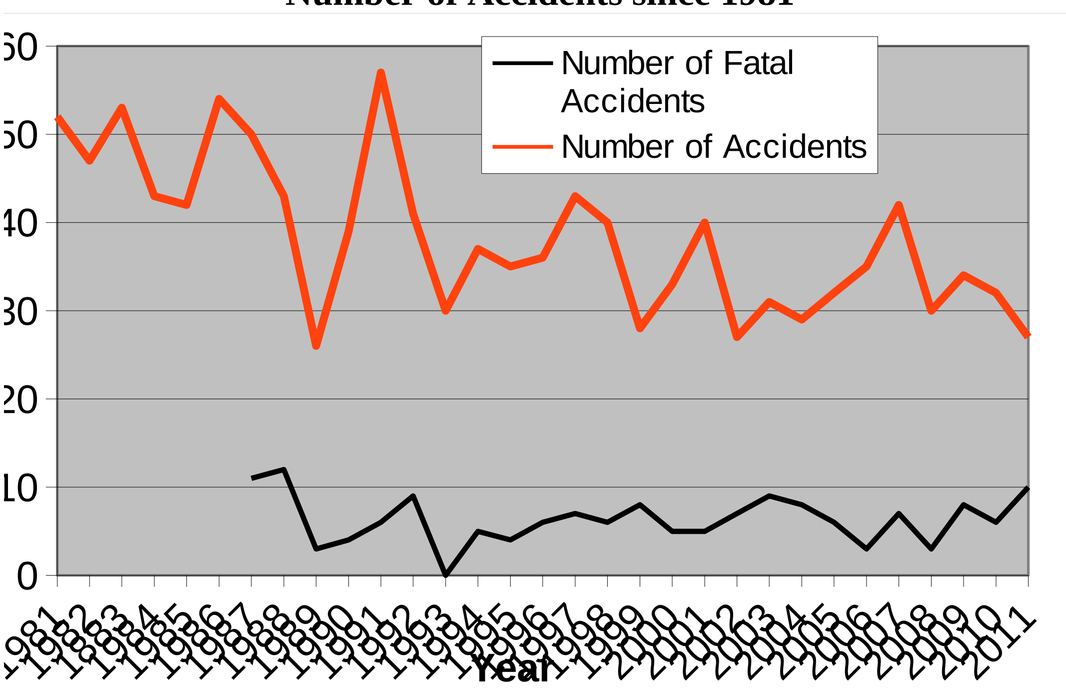

Figure 1 Total number of accidents and fatal accidents on a per year basis.

[1] See Appendix A for a detailed list of reasons and steps you can take to address these issues.

Figure 1 shows the total number of accidents and fatalities from 1981 to the present. As the figure shows, there is a large variation in the number of accidents each year. The top line is the number of accidents each year, while the lower line is the number of fatal accidents. Any analysis of this data shows two disturbing trends. One is that the number of fatal accidents is a large percentage of the total number of accidents each year. The other is that both fatal and nonfatal accidents have reached a plateau. Breaking through this plateau will require a shift in our thinking and/or procedures. This will require that glider clubs and commercial operators create a strong safety culture. Increased rules and regulations may not provide the motivation individuals need to reduce these accidents. A safety culture requires everyone, pilots, line-crews, and passengers to be involved examining both flying and ground handling operations. Only by stopping accidents before they happen can we hope to break through this plateau and further reduce the number of soaring accidents.

As this figure also shows, the long-term trend for fatal accidents has also reached a plateau. However note that in 1993 there were zero fatalities, and the SSF trustees see no reason why we can't return to this number. Every US glider pilot should dedicate themselves to obtaining the goal of ZERO fatal soaring accidents.

FY11 ACCIDENT SUMMARY

Number of Accidents

For the twelve-month period ending October 31, 2011, twenty-four (24) gliders, two (2) motor-gliders, and one (1) towplane were involved in twenty-seven (27) separate accidents meeting the reporting requirements of NTSB Part 830 of the Code of Federal Regulation. This represents a 15.6% decrease in the number of accidents reported during the FY10 reporting period. The five-year average for the FY07 – FY11 reporting period is 33.0 accidents per year, representing a 4.6% decrease in the average number of accidents from the previous five-year period.

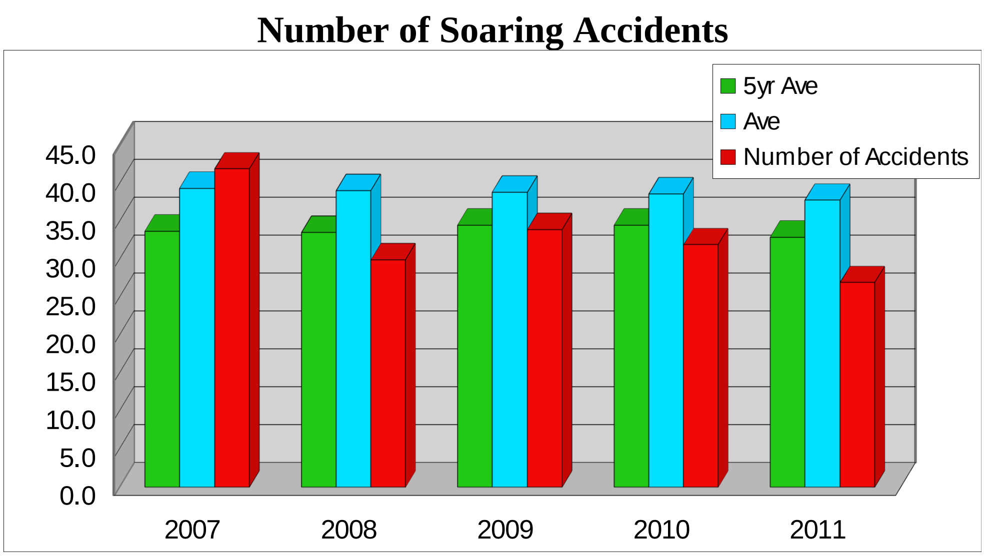

Figure 2 Number of accident, 5 year average 2007 - 2011

While the average number of accidents per year has shown a steady decline since 1981 (averaging 45.6/year in the 80's, 38.6/year in the 90's and 33.3/year in the 00's) the number of accidents each year remains too high. In addition, the average number of fatalities has remained nearly constant, at just over 6 per year since the mid 1990's. In the FY11 reporting period ten (10) accidents resulted in fatal injuries to ten (10) pilots and passengers. In addition, four (4) pilots and two (2) passengers received serious injuries while twenty-three (23) pilots and six (6) passengers received minor or no injuries during the FY11 reporting period.

Phase of Flight

The number of accidents that occur during the approach and landing phase of flight again surpass those recorded during any other phase of flight. For the FY11 reporting period, approach and landing accidents attributed approximately 59.3% of the total number of accidents reported for the year. This continues a historical trend where landing accidents contribute to the largest number of accidents year in and year out. Takeoff accidents account for just under 19% of the number of accidents, meaning that over 79% of the number of accidents occurred during the takeoff and landing phase of flight.

Percentage of accidents that occur in various Phase's of Flight

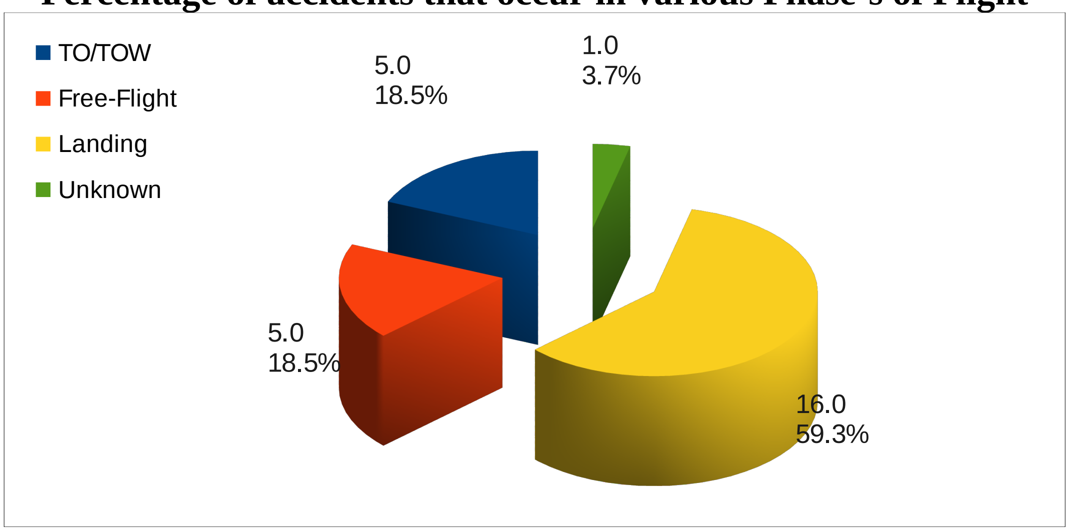

Figure 3 Accident phase of flight

While it should come as no surprise that a majority of accidents occur during takeoff and landing, where the tolerance for error is greatly diminished and opportunities for pilots to overcome errors in judgment and decision-making become increasingly limited. This trend coincides with a 1985 National Transportation Safety Board study initiated to determine the phases of flight in which aircraft accidents are most likely to occur. The study concluded that approximately 60% of all aircraft accidents occur during the first two minutes or the last four minutes of the average flight, even though these flight phases typically account for less than 16% of actual flight time.

Launch Accidents

Four gliders and one towplane were substantially damaged in the five Premature termination of the tow (PT3) take-off accidents that occurred during the FY11 reporting period. Three gliders involved in these accidents were being aerotowed while the fourth glider was being auto-towed. One towplane was damaged in a PT3 accident. It should also be noted that ALL of these accidents resulted in fatal injuries to a pilot or passenger. The PT3 accidents illustrate this year's trends.

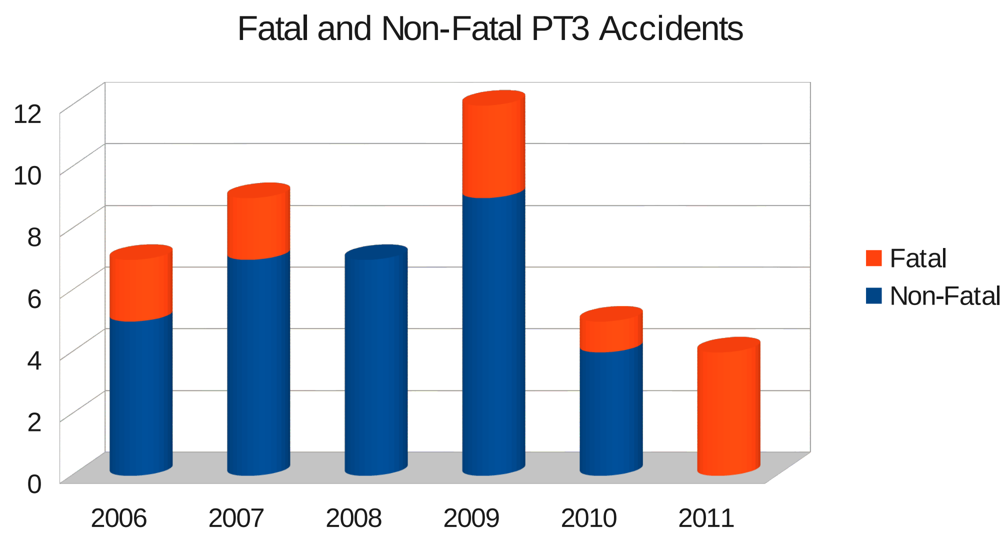

Figure 4: Number of fatal and non-fatal PT3 accidents 2006 - 2011

Figure 4 shows the number of fatal (orange) and non-fatal (blue) accidents reported during the 2006 – 2011 reporting periods. This figure shows that historically, PT3 accidents are fatal about 25% of the time. In 2008, none of the PT3 accidents were fatal, in 2011 ALL of them were.

The pilot of a LET L-33 Solo was fatally injured while the pilot of the Callair A-9 tow-plane was uninjured after the towrope broke during an aerotow launch. The tow-pilot reported the ground roll seemed normal but the tow-plane failed to climb as expected. The tow-pilot then noticed the gliders spoilers were deployed and the glider was having difficulty maintaining a stable tow position. The tow-pilot then radioed the glider, but received no response so he attempted to maneuver towards some emergency landing areas. The glider then pitched up, the tow-rope broke, and the glider the rolled and impacted terrain in a steep descent. *NTSB ERA11LA234*.

The ATP rated pilot received fatal injuries and the ATP rated pilot examiner received serious injuries when the Schweizer 2-32 stalled and spun while practicing a low-altitude rope break. The pilot was flying with an examiner to reissue an expired flight instructor certificate. The tow-pilot reported that as the flight was ascending through about 200 ft AGL he felt the glider release. Witnesses reported seeing the glider release and enter a steep right turn before descending into the terrain. *NTSB WPR11LA317*.

The pilot of a CAPSTAN type 49B received serious injuries while the pilot rated passenger received fatal injuries after the glider aborted the aerotow launch and crashed in a tree. The tow-pilot reported the ground roll was normal, but around 100 ft AGL he noticed a poor climb rate and saw that the glider's spoilers were deployed. The tow-pilot then signaled the glider glider using the standard SSA rudder waggle, indicating the glider pilot should check the spoiler position. The glider pilot responded by activating the release and making a left turn in an attempt to land on a divided highway beside the airport. The glider collided with trees while maneuvering to land and the passenger fell out of the glider after it came to rest in a tree. *NTSB ERA11FA401*.

The pilot of a Callair A-9B tow-plane was fatally injured while conducting an aerotow launch. Witnesses reported the takeoff appeared normal, but the flight encountered some turbulence shortly after lifting off. About 350 ft AGL the glider pilot reported loosing sight of the tow-plane so he released and returned to the airport for an uneventful landing. The witness reported that after the release, the tow-plane appeared to stall/spin when the right wing of the tow-plane dropped and it entered a 60-70 deg nose down attitude. The tow-plane completed 1/2 of a rotation before the witness lost sight of the aircraft. The pilot was airlifted to a medical facility and died about 7 hours later. *NTSB CEN11LA585*.

As can be seen by the above accidents, every pilot should be prepared for a failed launch. This includes making sure the launch area is free of obstructions, the aircraft is properly assembled, the pilot/passenger is briefed on possible actions, and the pilot is operating within their abilities. It should also be noted that in one case the towrope broke, while in every other case one of the pilots actuated the tow release in their aircraft. Every glider pilot should have a pre-determined plan of action that can be executed immediately if the launch does not go as planned.

In addition to practicing tow signals with your instructor, the pilot and instructor can simulate numerous situations and talk through the possible solutions without actually making a flight. These simulations can help build up a ‘mental store’ of possible actions, that you can use in the event of a real PT3 event. A quick review of these scenarios just before launch can prime the pilot to react appropriately when the launch isn’t going as expected. Finally, but most importantly, it is critical for pilots to understand that a pilot’s most basic responsibility is control of the aircraft. Regardless of the circumstances, FLY THE AIRCRAFT!!

Ground Launch Accidents

There was one ground launch accident during the FY11 reporting period.

The commercial pilot of a DG-1000 was fatally injured while conducting an auto-tow ground launch. The glider was being towed with a 234 ft nylon rote on a 2552 ft runway. According to witnesses the glider was about 3/4 of the way down the asphalt runway when it pitched up to a steep climb attitude. The glider was observed to release before entering a steep right turn and descending into the ground. *NTSB WPR12FA010*.

Cruise Flight Accidents

In the FY11 reporting period, six accidents were reported during the in-flight (free flight) phase, after release and before entering the landing pattern. Three of these accidents resulted in fatal injuries to the pilot. Factors contributing to these accidents include a glider impacting terrain while attempting to cross a ridge line, a pilot executing a low-altitude pass, and flight over unlandable terrain.

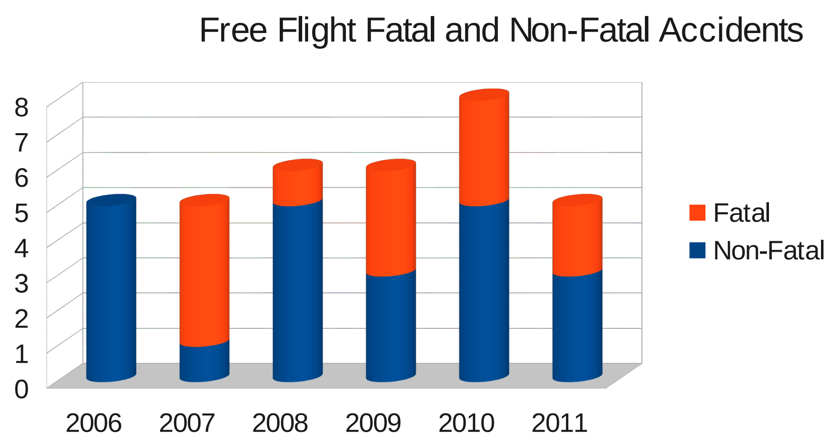

Figure 5: Number of Fatal and Non-Fatal Free-Flight (cruise) accidents

Figure 5 shows the number of fatal and non-fatal Free-Flight (cruise flight) accidents. As can be seen, the majority of these accidents typically result in fatal injuries to the pilot due to the high speeds or high 'G' loads involved in the impact. The non-fatal accidents are listed here, the fatal accidents are listed in the Fatalies section..

The pilot of a SGS 1-23D received minor injuries while the glider was substantially damaged after it impacted trees. The pilot reported that he entered an intentional spin at 3200 ft. After completing 3/4 of a turn the pilot attempted to recover, but he was unable to complete the recovery maneuver. The pilot reported that as the glider neared the ground he was able to maneuver towards some trees, impacting them instead of the terrain. *NTSB ERA11CA087*.

The commercial pilot of a SGS 2-32 was seriously injured and the glider was substantially damaged following a in-flight terrain. The 2 passengers were not injured. The pilot reported he was on a sigh-seeing flight released about 600 ft above mountainous terrain. The pilot then found the glider was descending rapidly so he attempted to maneuver toward lower terrain. The glider had insufficient altitude to cross a ridge line and it came to rest after impacted rocks, trees, and shrubs. *NTSB WPR11CA411*.

These accidents indicate the need to continuously evaluate how the flight is progressing and what options the pilot may have at his/her disposal. In a straight glide, the pilot can use this simple method to determine if the destination is reachable. Look at an object on the ground while maintaining a constant airspeed. If the object is disappearing under the nose, the glider will over fly that object. If the object is not moving or is moving up on the canopy, the pilot will need to find lift or make other plans. External or internal factors, such as pointing out objects on the ground, or handling multiple tasks while flying can lead to distractions. Fixations on a specific task or goal can also lead to conditions where safe flight conditions can no longer be maintained. Pilots should monitor their flight activities and use task-shedding schemes to reduce pilot workload during times of stress.

Landing Accidents

Accidents occurring during the landing phase of flight again accounted for the majority of injuries to pilots and damaged or destroyed gliders. For the FY11 reporting period, gliders hitting objects on final or during the landing roll accounted for the majority of the landing accidents. This was followed by hard landings, long/short landings, and stall/spin accidents. Half of the reported landing accidents occurred at the completion of local flights at the pilot's home airport.

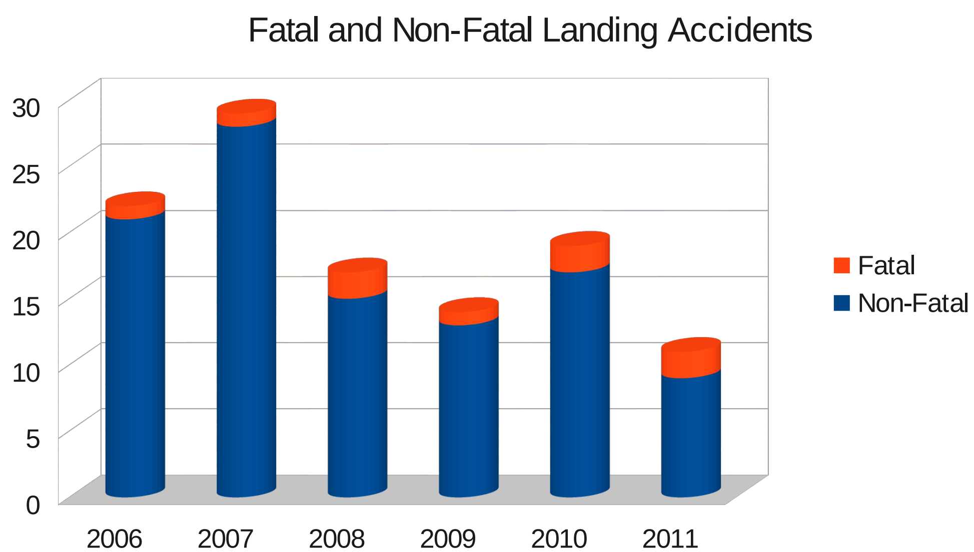

Figure 6: Number of Fatal and non-Fatal Landing Accidents

Figure 6 shows the total number of landing accidents from 2006 – 2011 broken down by fatal and non-fatal accidents. This figure shows that the vast majority of landing accidents do not result in fatal injuries to the pilot. A sample of the landing accidents in FY11 indicate the accident trends where the glider struck an object during the final approach or while on the ground roll.

The pilot of a H101 Salto was uninjured but the glider was substantially damaged after ditching in a lake. The pilot reported that while attempting to return to the gliderport he encountered 500 – 800 fpm sink. He was unable to exit the area of high sink, and thus he chose to land along a lake shoreline. The glider touched down about 30 ft from the shoreline. The right side of the tail separated during the ditching. *NTSB WPR11CA208.*

The pilot of a Solitare and his passenger were not injured while the glider was substantially damage while attempting to land at their home airport. The pilot reported he decided to change landing runways after noticing another glider waiting to depart on the runway. The pilot misjudged the turn to base and encountered wind shear conditions on final. The glider touched down about 500 ft short of the runway substantially damaging the fuselage and right wing after colliding with a railroad embankment. *NTSB CEN11CA166.*

The CFIG and student pilot of a DG-500 were not injured while the glider was substantially damaged when it struck a fence pole while landing at their home airport. The student pilot was practicing no-spoiler slips to landing. While on short final the student reduced the slip to maintain the glide path, and the glider encountered an area of sink. While in the flare over a fince the left wing impacted a fence pole. *NTSB CEN11CA225*.

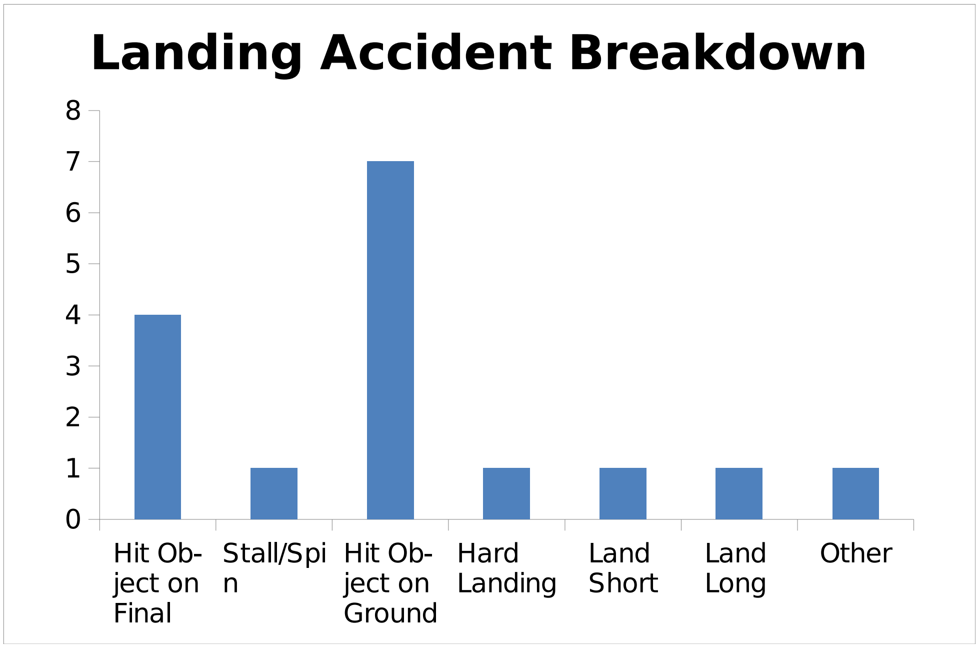

Figure 7: Reported result from landing accident

The pilot of a SFS 1-26 received minor injuries while the glider was substantially damaged after the glider struck an airport perimeter fence. The pilot reported he had climbed to 6,000 ft AGL about 13 miles from the gliderport. He encountered sinking air, so he obtained a landing clearance at an airport about 8 miles away. The glider struck the airport perimeter fence short of the landing runway. *NTSB ERA10CA291*.

The pilot of an ASW-27 received minor injuries while the glider was substantially damaged during an off-airport landing. The pilot was on a cross-country contest flight when high cirrus clouds moved into the area. The pilot selected a mowed hay field for an out-landing. The pilot reported he did not observer any obstructions but on short final the glider struck 2 electrical transmission lines 15 ft AGL that were running diagonally across the glide path.. *NTSB ERA11CA288*.

The CFIG and rated pilot of a SGS 2-33A were not injured while the glider was substantially damaged when the glider struck tree, a berm and a guard rail short of the runway. The instructor reported this was the 3rd flight in a flight review with a rated glider pilot. While about 500 ft AGL and 2000 ft from the end of the runway the instructor noted the glider was slow and he lowered the nose and told the pilot to increase the airspeed to compensate for the headwind. The instructor later stated that he did not assume control of the glider. The rated pilot reported that he relinquished the flight controls when the instructor moved the stick forward. The glider continued until it was about 75 ft AGL when it banked violently to the right impacting trees and terrain short of the runway. *NTSB ERA11CA323*.

The pilot of a LS-3-17 was seriously injured and the glider was substantially damaged during a stall during the landing. The pilot reported he was on final with 20 deg of flaps and spoilers extended. At about 100 ft AGL the pilot decided to reduce the flap setting due to a cross-wind. While moving the flap handle his hand slipped and the flaps moved rapidly to a new position.

The glider pitched down due to the flap change, and the pilot pulled back, causing the glider to stall and collide with the ground. *NTSB WPR11CA338*.

The pilot of an ASW-27 was not injured but the glider was substantially damaged after it it ground looped during an off-airport landing. The pilot reported that he was unable to locate a thermal and selected a filed for an off-airport landing. After an uneventful approach and landing the pilot applied heavy breaking, causing the glider to pitch forward. Both wings then contacted crops that were located on both sides, with the left wing engaging the crops more fully than the right. The gliders empennage was substantially damaged during the ground loop. *NTSB WPR11CA342*.

The remaining landing accidents include problems associated with striking objects on final or during the landing roll and off-airport landings.

While a detailed look at all landing accidents is beyond the scope of this report, the reader is encouraged to review the NTSB reports for additional details. One point that should be made is that many pilots report encountering ‘heavy sink’ on short final. There are numerous reasons for this, and one of the most insidious is a condition known as wind gradient. It is well know that wind speeds can, and do, vary with altitude. A wind gradient is a change in wind speed with altitude.

When a gradient, or shear, is encountered the forces acting on the glider change and the glider responds to those changes. One noticeable change is an apparent increase in the gliders sink rate with a reduction in wind speed, resulting in a tendency to land short. This occurs as the glider attempts to maintain its trimmed airspeed or as the pilot pushed forward to maintain the desired airspeed. An analysis shows that a glider will land 53% shorter than expected when landing into a 20 Kt wind gradient. All pilots need to be trained to recognize and respond to wind gradient/shear conditions. The SSF’s goal orientated approach (see below) can help pilots accomplish this task.

Fatalities

Eight (8) glider pilots, one (1) tow-plane pilot, and one (1) motor-glider pilot were involved in ten (10) fatal accidents during the FY11 reporting period. This represents a 66.7% increase in the number of accidents (10 vs 6) from previous reporting period. Five (5) of the accidents occurred during the launch phase of flight (four (4) aerotow launches and one (1) auto-tow ground launch), three (3) of these accidents occurred in the cruise phase of flight, one (1) accident occurred in the landing phase of flight, and the remaining accident occurred for unknown causes.

As was noted earlier, ALL of the launch accidents in the FY11 reporting period resulted in fatal injuries to a pilot or passenger involved in the accident. This is an anomalous situation, as typically less than 1/4 of the launch accidents result in fatalities. The SSF will monitor the NTSB investigations and report any findings or observations at a later date.

It should also be noted that this report contains 3 new figures, showing the breakdown of fatal and non-fatal accidents in the launch, cruise, and landing phase of flight. The blue cylinder in figures 4, 5, and 6 show the non-fatal accidents, while the orange cylinder shows the fatal accidents. The total number of accidents is the sum of both fatal and non-fatal accidents.

Fatal Accidents 2007 – 2011

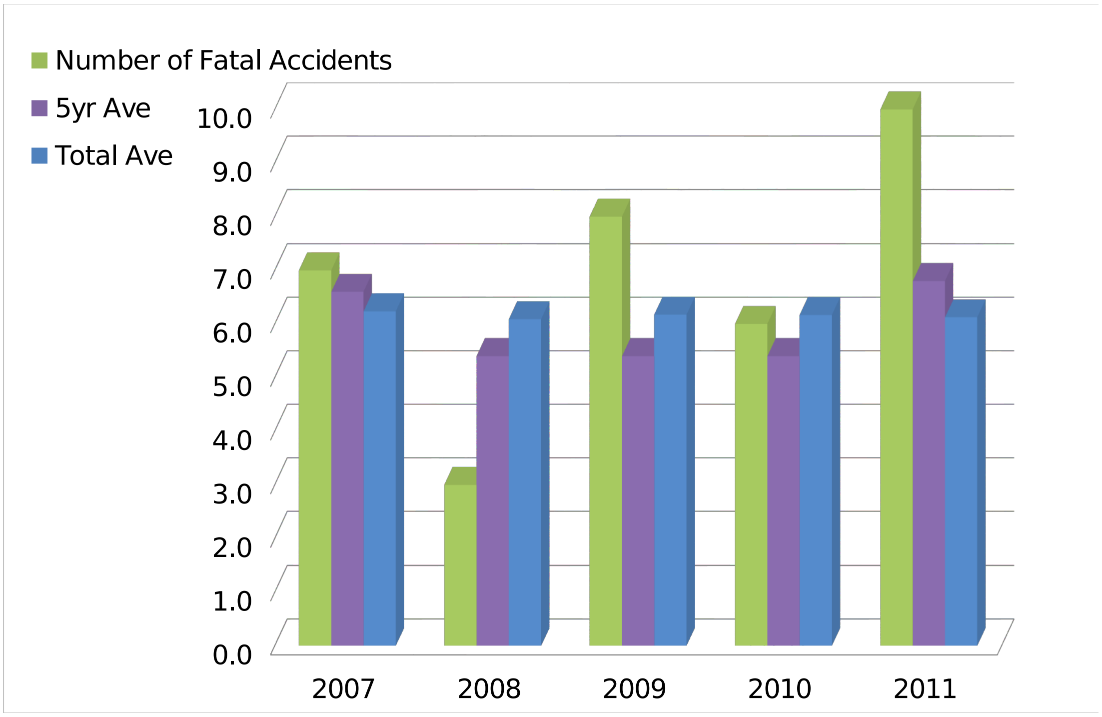

Figure 8: Number of fatal accidents, 5 year average, and average since 1987

The NTSB is still investigating these fatal accidents and no probable cause has been issued for any of these accidents. The reports below are summarize the five (5) non-PT3 accidents. The PT3 section above provides details of those fatal accidents.

The commercial pilot of a Standard Libelle was fatally injured and the glider was substantially damaged following a collision with an embankment. A witness reported that after the glider released at pattern altitude it began a series of steep banked turns. It then climbed steeply, appeared to fly inverted and looped. The glider then entered a 60 deb pitch down attitude and disappeared from view with the wings level. The wreckage was found in a gully with substantial damage to the right wing. *NTSB CEN11LA239*

The private pilot of a Grob G102 Club Astir was fatally injured and the glider was substantially damaged following an impact with high voltage transmission wires. The flight departed Boulder Municipal Airport about 1620. About 55 minutes later several witnesses reported seeing the glider a sprial turn towards the ground. Another *NTSB CEN11FA259*.

The private pilot of an ASW-20 was fatally injured after the glider impacted terrain for unknown reasons. The glider wreckage was located along Horeshoe Meadows Road at 7,400 ft MSL on the eastern slope of the Inyo National Forrest mountain range. *NTSB WPR11FA302*.

The commercial pilot of a Pipistrel Taurus was fatally injured after the motor-glider made a hard landing on a golf course sidewalk. Witnesses reported observing the motor-glider maneuvering at low altitude with the engine running. The wreckage was found a short time later with structural damage to the right wing and a partial separation of the empennage. *NTSB CEN11LA465*.

The commercial pilot of a BG-12B was fatally injured and the glider was substantially damaged after it collided with terrain after entering a low-altitude stall/spin. The pilot was participating in a fly-in event and this was his 2nd flight in the glider. After completing a local flight, the pilot radioed that he was inbound for landing. A witness then reported seeing the glider at mid-field about 75 ft AGL flying along the runway. At the end of the runway the glider executed a smooth pitch-up maneuver and then entered a climbing left bank. About 300 ft AGL the glider stalled and entered a left hand spin. The glider completed one full rotation before disappearing from sight behind some trees. The wreckage was found about 600 ft North of the arrival end of runway 16. *NTSB WPR11FA392.*

For the five-year period 2007 – 2011, 37 pilots and passengers received fatal injuries while soaring. This equates to a five-year average of 7.4 fatalities per year, no change in the number of souls lost from the previous 5-year period. Looking at the number of accidents, the data shows a 5-year average of 6.8 fatal accidents per year, an increase of 26% from the past 2 5-year periods, and 6.1 fatal accidents per year since the SSF began collecting fatal accident data in 1987. While the 5-year average is down from the initial rate of 7.2 fatalities per year recorded in 1991, the long-term trend is not encouraging. All glider pilots need to evaluate their skills and procedures with an eye toward determining how we can eliminate fatal accidents from our sport.

Damage to Aircraft

A total of twenty-four (24) gliders, two (2) motorgliders, and one (1) tow-planes received substantial damage during this reporting period. This was the only type of damage reported during this 12 month period.

The large number of damaged gliders has a significant impact on club and commercial operators flight operations. Not only is there the immediate issue of dealing with the injuries resulting from the accident but also the long-term impact cannot be forgotten. Typically the damaged glider will be out of service for several months while it is being repaired. During this time flight operations may be reduced, or suspended if this is the operation's only glider. This can place a significant financial strain on the club or commercial operator.

A strong 'safety culture' is a large part of the solution to reducing the number and severity of glider accidents. Every pilot must continuously evaluate the ground and flight operations with an eye toward preventing incidents from becoming accidents. The SSF web site now contains an incident reporting form http://www.soaringsafety.org/incident.html that individuals can use to anonymously report issues that might impact a pilot's or passenger's safety. The SSF will use this information to aid in identifying accident trends and to formulate procedures to assist pilots and instructors in preventing future accidents.

Damage to Aircraft

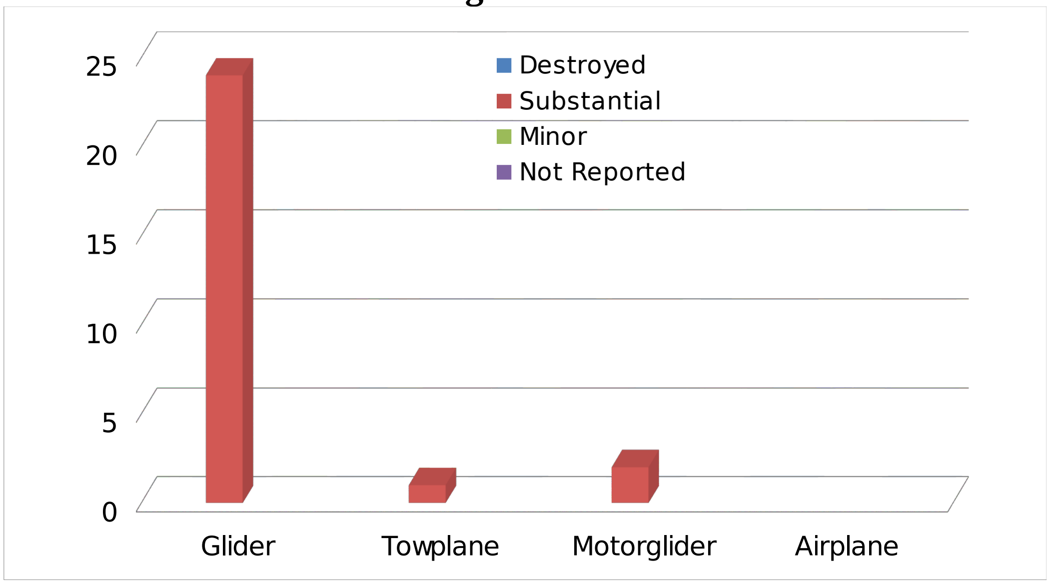

Figure 9: Types of damage to gliders, towplanes, motorgliders, and airplanes

Auxiliary-Powered Sailplanes

For the twelve-month period ending October 31, 2011 two (2) accidents involving auxiliary powered sailplanes were reported to the National Transportation Safety Board. One pilot received fatal injuries while the other pilot was uninjured. This represents a substantial decrease (33%) in the number of accidents when compared to the previous reporting period.

The pilot of an Pipistrel Sinus 912 was not injured but the motor-glider was substantially damaged after it ground looped while landing on an airport. The pilot reported that during the landing flare a gust of wind caused the glider to yaw 15 deg to the runway heading. The pilot considered and rejected the idea of a go-around and instead attempted to land in the grass area adjacent to the runway. Another gust 'caught' the right wing and the motor-glider ground looped. *NTSB CEN12CA038*.

Accidents Involving Tow-Aircraft

During the FY11 reporting period one (1) accident involving tow aircraft occurred resulting in fatal injuries to a tow-pilot. Three (3) other accidents occurred while a glider was being aerotowed.

Accidents by SSA Region

A comparison of the geographic locations of accidents in relation to SSA Regions tends to reflect the geographic distribution of the SSA membership. In general, those regions having the greatest populations of SSA members and soaring activity tend to record the highest numbers of accidents[2].

[2] See Appendix A for more details

Accidents by SSA Region

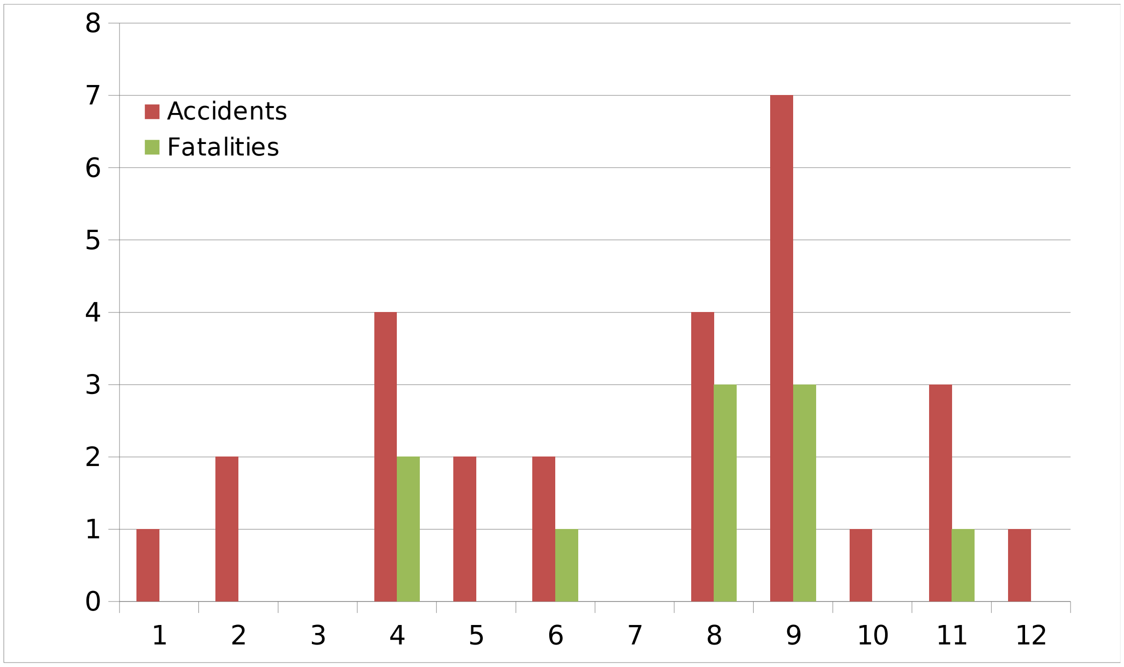

Figure 10: Number of accident per SSA Region

Flight Training and Safety Report

In early August the SSF was informed that the insurance company has seen a dramatic increase in the number of accidents/claims in the month of July. It was almost 1 claim per day! With this information in hand the SSF Trustees started looking for root causes. One factor that appears to have played a significant role is the weather. An analysis of On-Line Contest (OLC) data shows a spike in reported flights that corespondents with this increase in insurance claims.

SSA Region	2008	2009	2010	2011-June-14	2011-Sept-5	2011
1	3.05	4.61	4.37	2.47	4.25	4.47
2	5.28	5.48	5.42	3.81	4.74	5.04
3	3.86	3.93	4.95	2.67	4.28	4.85
4	3.87	4.10	4.71	2.97	3.73	3.27
5	5.40	5.21	5.77	5.26	5.71	5.93
6	7.43	7.14	7.39	2.71	5.20	5.58
7	5.12	5.37	4.36	3.24	5.67	6.47
8	4.96	5.28	5.68	4.67	6.70	6.89
9	4.28	3.84	4.49	4.15	5.48	6.11
10	4.64	6.42	4.77	3.92	7.10	7.50
11	5.12	4.65	4.68	4.34	5.06	5.39
12	5.28	5.34	5.45	3.57	5.44	5.93
Total	4.93	5.00	5.13	4.18	5.58	5.95
# of Sites	244	241	232	169	214	243

Table 1: Number of OLC Flights/Pilot in each SSA Region

Table 1 contains data extracted from the OCL web site. This site allows the visitor to download cumulative data to in several formats. The SSF downloaded the flight data per SSA region in June 2011 (before being notified of the spike in accidents. After being notified the SSF again downloaded 2011 data. A preliminary analysis of this data shows the following.

The number of sites submitting at least 1 flight to the OLC system has remained stable around 243. The raw data, not shown, also shows that there is a steady increase in the number of pilots participating and the number of flights they turn in is also increasing. The question here is, can we correlate the OLC activity with the accident rate in the US?

There were a total of twenty-sever (27) accidents reported to the NTSB in the FY11 reporting period (November 1, 2009 to October 31, 2010). Twelve (12) of them, less than half, occurred in the first eight (8) months (though June 30, 2011). The remaining fifteen (15) accidents occurred in the remaining four (4) months. So the number of accidents appears to spike in the July time frame, which matches the spike noted by the insurance company. As shown by the OLC data, there is a sharp increase in the number of flights per pilot reported in the September 5 column. Note that not all regions noted this spike, notably region 5 remained high even through the spring of 2011. It should be noted that the Seniors contest occurs in region 5 during this time period, and a large number of pilots turned in OLC flights during this contest. It should also be noted that only two (2) accidents (one in March and the other in May) occurred in region 5 during the FY11 reporting period.

While this data is not conclusive, it does suggest that the weather throughout the US was poor during the spring of 2011 and this prevented pilots from flying. The weather appears to have improved in the late June time period and many pilots came out to begin flying. Yet these pilots were no longer as proficient as they were in the fall of 2010, so they started making mistakes and poor decisions. This lead to the spike in accidents we observed in the July to October time period.

The conclusion is, that pilot proficiency plays a major role in accident rates in the US. It also shows that decision-making skills also decline with extended lay-offs and pilots need to take this into account. Pilots should look for ways to continue to practice their decision-making skills during non-flying periods.

SSF Recommendation, Risk Management Training

As noted above, pilot decision-making skills are an important factor in reducing the number of accidents in the US, and throughout the global soaring community. A review of the relevant sections of Part 61 will show that each pilot must receive Aeronautical Decision Making (ADM) training in preparation for a pilot license. Unfortunately most pilots do not receive adequate training in this task which leads to a lack of skill. It also appears that most pilots fail to evaluate this skill during a Flight Review, instead focusing on the mechanical skills needed to manipulate the gliders flight controls. The SSF recommend that pilots and flight instructors place a greater focus on these ADM skills.

It in now recognized that ADM skills are a learned behavior, just as you need to learn how to keep the yaw string centered, you need to learn how to make good decisions. Also, just as you have to continuously practice keeping the yaw string centered, you need to practice making good decisions. The SSF's role is to provide you, your instructor, and your club's management with the resources and support systems needed to help you obtain and maintain good ADM skills.

For the past few decades the airlines and military have recognized this fundamental concept, that the key to reducing accidents is better ADM training. They also recognize that pilots must deeply integrate this ADM training into their daily operations and practice it in the cockpit. It is not sufficient to do some classroom exercises and then forget about it once you get into the cockpit. All glider pilots need to take this same approach to heart if we want to lower the number of accidents.

Risk Management is now recognized as one of the basic ADM skills that a pilot needs to learn and practice before, during, and after every flight. This is another major issue that the airlines and military learned over the past few decades. That is, pilots make mistakes and often fail to evaluate Risks properly. In the 1950's a large increase in the pilot population resulted in a large increase in the number of accidents. The response was to perform an in-depth analysis of a series of accidents to find a common cause. Then a rule was developed to prevent pilots from making the same mistakes, with the result – a lower accident rate. As an example, pilots use pre-launch checklists to ensure that the aircraft is properly configured before beginning the take-off roll.

While this concept worked for a while, in the early 1980's it had become apparent that the aviation accident rate had reached a plateau and further rules were not reducing the accident rate.

Studies by several institutions discovered that trying to prevent pilots from making mistakes was not effective, because humans are prone to making mistakes. We make them for a wide variety of reasons. This lead to the realization that if we can't eliminate mistakes, we can develop mechanism to improve the chances of us detecting when we have made one. This is know as the Swiss Cheese model of ADM.

A good example of this is the glider assembly process. The process starts with having sufficient knowledge to complete the process successfully, sufficient room, a knowledgeable assistant and no distractions. There are then multiple checks after the assembly process is completed, including a walk-around inspection, positive control checks (PCC), and critical assembly checks (CAC) to ensure that the assembly process was correctly completed. These multiple barriers allow the pilot to catch errors or mistakes.

Imagine that during the assembly process you are installing the horizontal stabilizer and after putting it in place you realize you forgot the assembly tool in the cockpit side pocket. No problem you think, I'll just walk around the wing and get it. While digging in the cockpit a fellow pilots comes up and asks you a question about the day's task. You interrupt your assembly process and begin to answer his question when you notice the weather is changing so you decide to go into the clubhouse and check the the radar returns. The check reveals that things will be OK, but the day will be shorter than you expected so you need to hurry if you are to get a short X-C flight in. You go back out and rush though the rest of the prep work before pushing the glider out to the flight line for your launch. Begin rushed, the pilot also decides the PCC and CAC checks are not needed, as they have never found anything before and he needs to get going now.

In this scenario you can see that the pilot failed to finish the assembly process, and due to the distraction he failed to notice this mistake. We all need to realize that this mistake is not because the pilot was inexperienced, but that distractions caused the pilot to miss an important step and then the changing conditions caused him to ignore the other actions that would have caught this mistake. It should also be noted that the pilot failed to adequately evaluate the potential risks he was facing. In this case the changing conditions and need to rush the launch created increased risks that the pilot needed to manage.

As noted above, pilots need to be trained to recognize and evaluate potential risks. Risk Management (RM) skills are the 1st step in building an effective ADM program. Not performing this RM task can be as deadly as entering a stall/spin at 100 ft AGL. The airlines and military have found that scenario based training, such as the scenario presented above, is an effective RM/ADM training method. Pilots who receive this type of training, and then continue to practice it have fewer accidents that pilots who ignore or avoid this training.

When reading this type of scenario, you should begin by identifying the potential risk factors and then determine how they are changing. You then need to determine what actions you can talk to mitigate those risks. Note that eliminating the risks is one strategy, but reducing them to an acceptable level is also an reasonable approach. In the scenario above, the risk mitigation or elimination actions could include, but are not limited to: (1) decide not to fly after all, (2) perform the PCC and CAC checks; (3) have the wing runner ask every pilot if they have completed the PCC/CAC checks, (4) remove the horizontal stabilizer from the tail when you go to get the assembly tool, (5) check with other pilots about the changing weather, (6) change your flight plan to conduct a local flight. The list can go on, and needs to be tailored to the skill and experience level of the pilot.

Also notice that action's 3 and 5 uses good Single Pilot Resource Management (SPRM) skills, where the pilot involves others in helping to evaluate and manage the potential Risks.

The SSF has begun to build a scenario library, both text based and video clips, to help pilots and instructors provide better RM/ADM instruction and training. Visit the SSF web site and navigate through the On-Line Learning tab to the RM/ADM Resources page or follow this link http://www.soaringsafety.org/school/adm.html directly to this page.

Only by improving, and continuously practicing, your RM/ADM will we reduce the number of accidents in the US soaring community.

SSF Recommendation, Stall Recognition Proficiency

As aviation accident statistics show, low altitude stall/spin accidents are often fatal. All pilots should evaluate their skill and proficiency in stall/spin recognition. Practice at a safe altitude with a competent instructor and also learn how the glider you fly reacts to stalls while thermaling. Have your instructor create a realistic distraction or do something to create an 'inadvertent stall'. Pay particular attention to the altitude loss after you recover, now imagine this happening while you are thermaling close to the ground in mountainous terrain. It should be noted that a windshear stall is quicker and more violent than the type of stall that can be practices using the elevator to stall the aircraft.

SSF Goal Orientated Approach

As the FY11 statistics show, the majority of soaring accidents continue to occur in the approach and landing phase of flight. For one reason or another, the pilot fails to make it to the landing area. Pilots need to consider multiple factors including: other traffic, wind, lift/sink, location, and distance remaining to the landing area in order to safely land a glider. Failure to account for one or more of these factors can leave the pilot low on the approach with very few corrective options available.

The SSF promotes a 'Goal Orientated' approach to landing a glider. This means that the pilot should select a point on the ground that will become the touchdown point for this landing. The pilot should then control the decent rate and flight path to maximize the chance of reaching this spot. If it becomes apparent that the spot will not be reachable, the pilot should select an alternate landing spot, and continue using the procedures described below to make a safe landing.

Pilots should consider that the best way to judge if a successful landing is imminent is to maintain a constant descent angle throughout the pattern. Picking the initial angle that will safely get you to the landing spot is a learned skill that depends in part on the glider's performance and configuration. The TLAR (That Looks About Right) technique can help you learn this skill. Work with a proficient instructor to learn ways to pick this initial angle.

Once a specific angle is selected, this angle the pilot can control the sink rate and/or flight path to keep this decent angle constant throughout the approach and landing. While most pilots may have difficulty identifying a specific angle, they will intuitively recognize when an angle changes. If the angle starts to go flatter, the pilot needs to adjust the gliders sink rate (by easing the spoiler handle slightly forward) or flight path (by turning the glider slightly toward the landing spot) until the angle stops changing. If the angle starts to get steeper, then increase the sink rate (ease the spoiler handle back) or flight path (turn the glider slightly away from the landing spot). By making a small adjustment at the first sign that the angle is changing, the glider pilot will find it easier to keep the glider on the proper glide-slope.

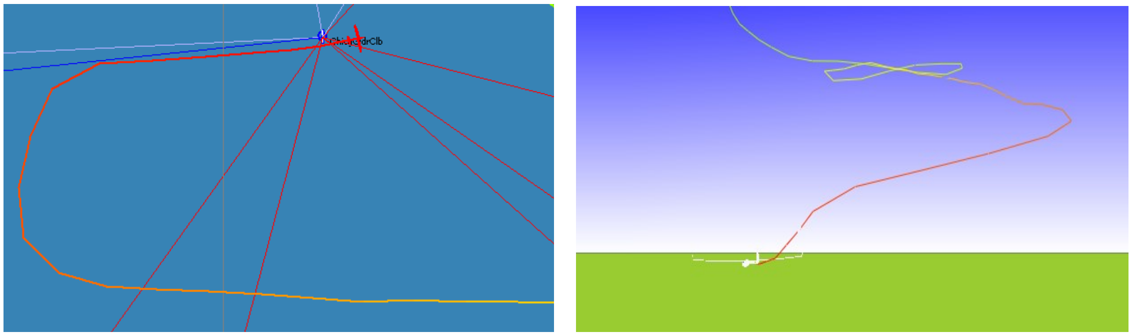

Figure 11: 2D and 3D view of a glider landing showing pattern and decent profile

The SSF 'goal orientated' approach does not require that the pilot fly the British Gliding Associations diagonal leg pattern. However, this pattern may be used if it makes it easier for the pilot to consistently make better landings. Pilots should consult a proficient instructor to learn this BGA technique or how to modify this idea slightly so it can be used by those pilots wishing to fly a traditional rectangular pattern.

Another tool that pilots and instructors should consider is that GPS recorder you installed to document your flight. Low-cost hand-held GPS units are available on the used market and can be carried in the training glider. The approach and landing portion of the flight can be extracted from the recorder and displayed to determine how the pilot is handling various conditions. It is also possible to download other pilot's traces from multiple Internet web sites (e.g., OLC) and examine how others tackle this demanding task.

Reducing Launch accidents

In FY11, takeoff accidents accounted for just over 18% of the number of accidents. This is particularly frustrating because both glider and launch vehicle are sitting on the ground before the launch begins. Additionally, as the reports show, several PT3 accidents occurred after the glider pilot intentionally terminated the tow at low altitude and then failed to execute the appropriate emergency landing procedures. Pilots can mentally prepare for an emergency and develop a specific set of action plans to deal with several contingencies. The task is then to execute the proper plan at the proper time. Flight instructors should continue to emphasize launch emergencies during flight reviews, club check rides and flight training.

Adding the letter "E" to the pre-takeoff checklist is a helpful reminder to concentrate on the emergency plan of action. Treating the wing runner as a member of the launch crew and using good Single Pilot Resource Management (SPRM) techniques can reduce the pilot's pre-launch workload. The wing runner can help prevent the possibility of a launch emergency by being observant for various discrepancies such as: dive brakes left open, canopy unlatched, tail dolly left on, or positive control check not accomplished. Fixing any problem before beginning a launch will help reduce the take-off type of accident.

The tow pilot also needs special training to be alert for signs of potential trouble. Is the glider pilot being hurried? Are conditions too gusty; is there fuel in the tow plane? In 2005 two tow-planes were substantially damaged when they ran out of fuel during a tow operation. Is the takeoff area clear of people and other obstructions? Has the tow pilot added the letter "E" to the pre-takeoff checklist and is he/she prepared for an emergency? Rear view mirror(s) located such that the top pilot can see the glider on the ground before launch and during the aerotow is highly recommended. Radios in both the glider and towplane are highly recommended.

Flight Instructor roles

Flight instructors play an important safety role during everyday glider operations. They need to supervise flying activities and serve as critics to any operation that is potentially unsafe. Other pilots and people involved with the flying activity also need to be trained to be alert to any safety issues during the daily activity.

The FAA has mandated that all instructors must include judgment training in the flight training process. Examiners will check for this training during the flight test. The FARs require that all flight instructors provide some kind of aeronautical judgment training during pilot training flights (student, private, commercial, and flight instructor). FAR 61.56 flight reviews also offer the flight instructor an opportunity to reach the glider pilot population on a continuing basis. Stressing judgment skills, as well as piloting skills, can help reduce the accident rate in the United States.

SSA REGIONS

Region 1 — Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont.

Region 2 — New Jersey, New York (south of 42^{nd} parallel), Pennsylvania (east of 78^{th} meridian).

Region 3 — New York (north of 42^{nd} parallel), Pennsylvania (west of 78^{th} meridian).

Region 4 — Delaware, District of Columbia, Maryland, Virginia, West Virginia.

Region 5 — Alabama, Florida, Georgia, Mississippi, North & South Carolina, Tennessee, Puerto Rico, The Virgin Islands.

Region 6 — Indiana, Kentucky, Michigan, Ohio.

Region 7 — Illinois, Iowa, Minnesota, Missouri (east of 92^{nd} meridian), North & South Dakota, Wisconsin.

Region 8 — Alaska, Idaho, Montana, Oregon, Washington.

Region 9 — Arizona, Colorado, New Mexico, Utah, Wyoming.

Region 10 — Arkansas, Kansas, Louisiana, Missouri (west of 92^{nd} meridian), Nebraska Oklahoma, Texas.

Region 11 — California (north of 36^{th} parallel), Guam, Hawaii, Nevada.

Region 12 — California (south of 36^{th} parallel).

APPENDIX A

Request for Club, Chapter, and Commercial Operator information

The Soaring Safety Foundation is tasked with evaluating US soaring accidents and developing plans that can help reduce these accidents. Since 1981 the SSF has developed and implemented numerous programs and ideas. While the accident rates are trending in the right direction, one serious question remains. How can the SSF generate meaningful accident statistics which can then be used to devise appropriate response plans?

The difficulty is that the SSF can easily obtain the raw number of accidents (the accident rate), but it has few, if any, means to turn these raw numbers into meaningful statistics. Most aviation accident statistics are reported as a fraction or percentage of accidents per flights or accidents per flight hours. To obtain these statistics the SSF needs to know the number of flights or the number of flight hours. Historically, these flight numbers/hours have not been made available to the SSF.

Other general aviation groups calculate their flight numbers/hours by noting the gallons of aviation gas sold throughout the US. Statistical analysis methods can be used to determine the average fuel burn rate for the fleet of general aviation airplanes. Thus, these aviation groups can compute meaningful accidents statistics. Since gliders use little or no fuel, we do not have an easy way to generate the flight number/hours valued needed to create meaningful statistics.

The SSF needs the support of a majority of the clubs, chapters, and commercial operators in the US to help correct this problem. Only by voluntarily submitting this information can the SSF really achieve its goal of reducing accidents. Once the SSF trustees have these number we can combine them with the raw NTSB accident numbers to generate meaningful statistics.

What can your club, chapter, or commercial operator do? At a minimum use the pilot/club flight time form on the SSF web site http://www.soaringsafety.org/forms/pilot-times.html annually to report the number of launches and the total flight time that your club ships performed. If you also launch private gliders, then determine their total flight time as well. This information should easily come from your club records, and these two numbers would greatly help the SSF and they will be considered strictly confidential unless otherwise specified.

Do you want to do more? Then send us as much additional detail as you feel comfortable doing. One option would be to extract your club records into an Excel spread sheet and email the file to the SSF. The more details we have, the more analysis we can perform.

One word of caution, in order for these numbers to be statistically valid, we must get details from a majority of the clubs, chapters, and commercial operators. If not, then the number will be skewed and could reflect specific operator issues instead of national trends. Thus, the SSF needs the support from a large portion of the soaring community.

Email your report to any SSF trustee. Rich Carlson <rcarlson501 at comcast.net>, Burt Compton <burtcompton at aol.com>, Stephen Dee < Motorgliderman at aol.com> Ron Ridenour <ronsnimbus3 at aol.com>, Bernald Smith <bernald at juggernaut.com>, or the generic SSF Webmaster <webmaster@soaringsafety.org>.

APPENDIX B

NTSB Part 830

The responsibility for investigation of aircraft accidents in the United States was mandated by Congress to the National Transportation Safety Board (NTSB) through The Department of Transportation Act of 1966. This act tasked the NTSB with determining the probable cause of all civil aviation accidents in the United States.

From 1991 - 94, the general aviation community alone accounted for approximately 1,800 aircraft accidents per year. Due to this high level of investigative workload and limited available resources, the NTSB often delegates to the Federal Aviation Administration (FAA) the authority to investigate accidents involving aircraft weighing less than 12,500 pounds maximum certified gross weight. Consequently, many glider accidents meeting the NTSB reporting criteria are investigated by representatives of the FAA.

All aircraft accidents involving injury to passengers or crewmembers or substantial damage to the aircraft must be reported to the NTSB.

The terms used in this report to define injury to occupants and damage to aircraft are included in NTSB Part 830 of the Code of Federal Regulations.

Definitions

Aircraft - a device that is used or intended to be used for flight in the air.

Operator - Any person who causes or authorizes the operation of an aircraft.

Aircraft Accident - An occurrence associated with the operation of an aircraft which takes place between the time any person boards the aircraft with the intention of flight and all such persons have disembarked, and in which any person suffers death or serious injury, or, in which the aircraft receives substantial damage.

Fatal Injury - Any injury that results in death within 30 days of the accident.

Serious Injury - Any injury which:

1) Requires hospitalization for more than 48 hours, commencing within 7 days from the date the injury was received;
2) Results in the fracture of any bone except simple fractures of fingers, toes, or nose;
3) Causes severe hemorrhages, nerve, muscle, or tendon damage;
4) Involves any internal organ; or
5) Involves second- or third-degree burns, or any burns affecting more than 5 percent of the body surface.

Minor Injury - Injury not meeting the definition of fatal or serious injury.

Substantial Damage - Damage or failure which adversely affects the structural strength, performance, or Flight characteristics of the aircraft, and which would normally require major repair or replacement of the affected component. Engine failure or damage limited to an engine if only one engine fails or is damaged, bent fairings or cowling, dented skin, small punctured holes in the skin or fabric, ground damage to rotor or propeller blades, and damage to landing gear, wheels, tires, flaps, engine accessories, brakes, or wingtips are not considered substantial damage for the purpose of this part.

Destroyed - Damage to an aircraft which makes it impractical to repair and return it to an airworthy condition. This definition includes those aircraft which could have been repaired, but were not repaired for economic reasons.

Minor Damage - Damage to an aircraft that does not meet the definition of Substantial or Destroyed.

APPENDIX C

Phase of Operation

Ground Movement - Repositioning of the glider while on the ground. To meet the definition of an accident, occupants must be onboard the glider and movement must be conducted immediately preceding or subsequent to a flight operation that demonstrates the intention of flight. This includes taxi operations of auxiliary-powered sailplanes.

Takeoff - Begins at initiation of the launch operation, including aero-tow, ground launch, and self-launch, and is concluded at the point the glider reaches the VFR traffic pattern altitude. For ground launch operations, the takeoff phase continues until release of the towline.

Assisted Climb - Begins at the conclusion of the takeoff phase or point at which an auxiliary powered sailplane or a sailplane using an aero-tow launch climbs above traffic pattern altitude. This phase of operation is not included in ground launch operations.

In-flight - Begins at the point of release of the towline for all launch types and concludes at the point of entry into the traffic pattern or landing approach pattern for an off-airport landing.

Approach/Landing - Begins at the point of entry into the traffic or landing approach pattern and concludes as the glider is brought to a stop at the completion of the ground roll.

APPENDIX D

Accident Category Definitions

Hit Obstruction - Accident occurring during a ground or flight phase as a result of the glider colliding with a fixed object. This classification does not include bird strikes or ground / in-flight collisions with other aircraft.

Ground Collision - Collision of two or more aircraft while being repositioned or taxied while on the ground.

Loss of Directional Control - Accident which occurs as a result of a loss of directional control of the glider during takeoff or landing operations while the glider is on the ground.

Premature Termination of the Tow (PT3) - Any event, pilot, mechanical, or otherwise induced, which results in a premature termination of the launch process. This classification includes ground, aero-tow, and self-launch.

Mechanical - An event that involves a failure of any mechanical component of the glider. This classification includes accidents that result from faulty maintenance or a failure to properly install or inspect primary flight controls. In-flight structural failures caused by fatigue of structural components or pilot induced overstress of the airframe are included in this classification category.

Loss of Aircraft Control - An accident which occurs as a result of the loss of control of the glider for any reason during takeoff, assisted climb, in-flight, or approach / landing. This classification includes failure to maintain proper tow position during assisted climb.

Mid-air Collision - A collision of two or more aircraft which occurs during the takeoff, assisted climb, in-flight, or approach / landing phase of flight. This classification includes collisions involving gliders and other categories of aircraft (airplane, rotorcraft, etc.).

Land Short - Any accident which occurs as a result of the glider being landed short of the physical boundaries of the intended runway or landing area. This classification includes off airport landing operations.

Land Long - Any accident which occurs as a result of the glider being landed beyond the physical boundaries of the intended runway or landing area. This classification includes off airport landing operations.

Stall / Spin - Any accident which results from the inadvertent stall and/or spin of the glider during takeoff, assisted climb, in-flight, or approach / landing phases of flight.

Hard Landing - Any accident caused by a hard landing during the approach / landing phase of flight.

Other – Any accident caused by factors not defined within the previous categories.

APPENDIX E

SSA/SSF August Letter to the Membership

Dear Friends of our soaring community.

WHAT'S WRONG WITH SOARING? Nothing? Is the fact that we had more fatalities - 9 - last year than the entire US Naval Aviation community had, and that we've already had 7 fatalities this year through the middle of August just an anomaly? Is the fact that July 2011 had more accidents than any month in our accident history just an anomaly? Is the fact that we've already had more contest accidents this year than any full year of contests we can remember just an anomaly?

The SSF Trustees and SSA Board of Directors know these are not just anomalies! They are the direct result of us, the soaring community, not embracing an effective safety culture in our approach to soaring. When was the last time your soaring operation had a safety seminar that really addressed the operational issues at your field? When was the last time your flight instructor attended a SSF Flight Instructor Refresher Clinic (FIRC)? When was the last time you saw something that concerned you happen at your operation? What happened when you raised the issue with, the pilot, the ground crew, or your operations management?

The good news is that there is an path forward. We can reduce our accident rates, but only if we all act together and adopt the approach that the airlines and military developed. This approach builds on 2 basic premises. 1) good decision making and risk management skills are a learned behavior and 2) humans make mistakes and accidents are prevented by erecting multiple barriers to potential problems. A single 'silver bullet' solution will never make a meaningful dent in our accident rate.

To learn more about these solutions get involved! Have your instructors participate in the SSF FIRC program. This coming year we will use the FIRC to begin developing an effective training program that clubs, chapters, and commercial operators can implement. The SSF has been posting new training material (video clips and training scenarios) on it's web site (http://www.soaringsafety.org/school/adm.html). This site will be updated based on input from flight instructors attending SSF FIRCs. The SSF safety seminar and site survey programs can also help address these safety culture issues.

Folks, we are all people who love our sport. Do we not also love each other enough to make sure it's a safe sport so we don't hurt and lose our precious lives? Help us do better!

s/Al Tyler
Chairman of the SSA Board of Directors
s/Rich Carlson
Chairman of the Soaring Safety Foundation