SOARING SAFETY FOUNDATION

Nov 1, 2007 – Oct 31, 2008
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:

Soaring Safety Foundation
26260 W. Airport Rd.
Minooka, IL 60447
Richard Carlson <rcarlson501@comcast.net>

EXECUTIVE SUMMARY

This report covers the FY08 (November 1, 2007 to October 31, 2008) reporting period. A review of the NTSB accident database shows US soaring accidents during this time period decreased over 28% compared to the FY07 reporting period. FY08 also saw a 57% decrease in the number of fatal accidents. While these numbers indicate that the US soaring community has reversed the recent trend, reducing both the number of accidents and the number of fatalities, more improvements are needed. Only by instilling an "operational safety culture" can we continue to reduce the number of accidents that impact us all.

For the twelve-month period ending October 31, 2008, twenty-six (26) gliders, five (5) motorgliders, and one (1) towplane were involved in thirty (30) separate accidents meeting the reporting requirements of NTSB Part 830 of the Code of Federal Regulation. This represents a 28.6% decrease in the number of accidents compared to the FY07 reporting period. The five-year average for the FY04 – FY08 reporting period is 33.6 accidents per year, representing a 0.6% decrease in the average number of accidents from the previous five-year period.

While the average number of accidents has shown a steady decline since 1981 (averaging 45.6/year in the 80's, 38.6/year in the 90's and 33.2/year so far this decade) the number of accidents each year remains unacceptably 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 FY08 reporting period three (3) accidents resulted in fatal injuries to the pilot. In addition, seven (7) pilots received serious injuries while twenty-two (22) pilots and thirteen (13) passengers received minor or no injuries during the FY08 reporting period.

A review of the fatal accidents failed to show any common themes among the three accidents. The NTSB is still investigating two of these accidents; the probable cause for the third is listed as pilot incapacitation due to a cardiac event. While FAR 61.23(b)(1)(ii) states that glider pilots are not required to hold an FAA medical certificate, FAR 61.53(b) does state that glider pilots must self-certify, before every flight, that they are fit to act as pilot in command of a glider.

Of major concern is the continuing high percentage, over 54%, of accidents that occur during the landing phase of flight. It should also be noted that of the sixteen (16) landing accidents, ten (10), or 63%, of them occurred while the pilot was attempting to land on an airport. Eight (8) of these accidents involved the glider striking an object (i.e., tree, cactus, fence, etc) while on final approach, and wind shear was a contributing factor to three (3) of those accidents. In three of these accidents the glider struck an object during the ground roll.

The SSF has been promoting that pilots and instructors adopt a 'goal oriented approach' to pattern planning and execution. In this approach, pilots continuously evaluate how the glider is progressing while 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 very 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.

Takeoff accidents, accounted for 23% of the FY08 accidents. Both PT3 (Premature Termination of The Tow) and motorglider engine failure accidents occurred in the FY08 reporting period. Seven (7) accidents occurred during the take-off phase of flight. Five (5) gliders being aerotowed and two (2) motorgliders were involved in these accidents. 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 remind the pilot of the possibility of a launch emergency ("Are you ready for an emergency?") and be observant for various discrepancies such as: dive brakes left open, canopy unlatched, tail dolly left on, or positive control check not accomplished.

The tow pilot or winch operator 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? 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? Tow planes need a good rear view mirror, one that is located close to the tow pilot. Radios are highly recommended.

Five (5) motorgliders were involved in a variety of accidents in the FY08 reporting period. Motorglider pilots also have an additional responsibility during self-launch operations. They are the tow pilot and thus need to consider everything listed above. Fixing any problem before beginning a launch will help reduce the take-off type of accident.

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.

All these tasks need to be performed on every flight. Failure to do so can result in another accident.

TABLE OF CONTENTS

SOARING SAFETY FOUNDATION

ANNUAL SAFETY REPORT
FY 08

This report covers the FY08 (November 1, 2007 to October 31, 2008) reporting period. A review of the NTSB accident database shows US soaring accidents during this time period decreased over 28% compared to the FY07 reporting period. FY08 also saw a 57% decrease in the number of fatal accidents. While these numbers indicate that the US soaring community has reversed the recent trend, reducing both the number of accidents and the number of fatalities, more improvements are needed. Only by instilling an "operational safety culture" can we continue to reduce the number of accidents that impact us all.

For many reasons[1], this report represents an incomplete view of the accidents involving US glider pilots. Despite these limitations, this annual report is published to highlight some of the 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 glider 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

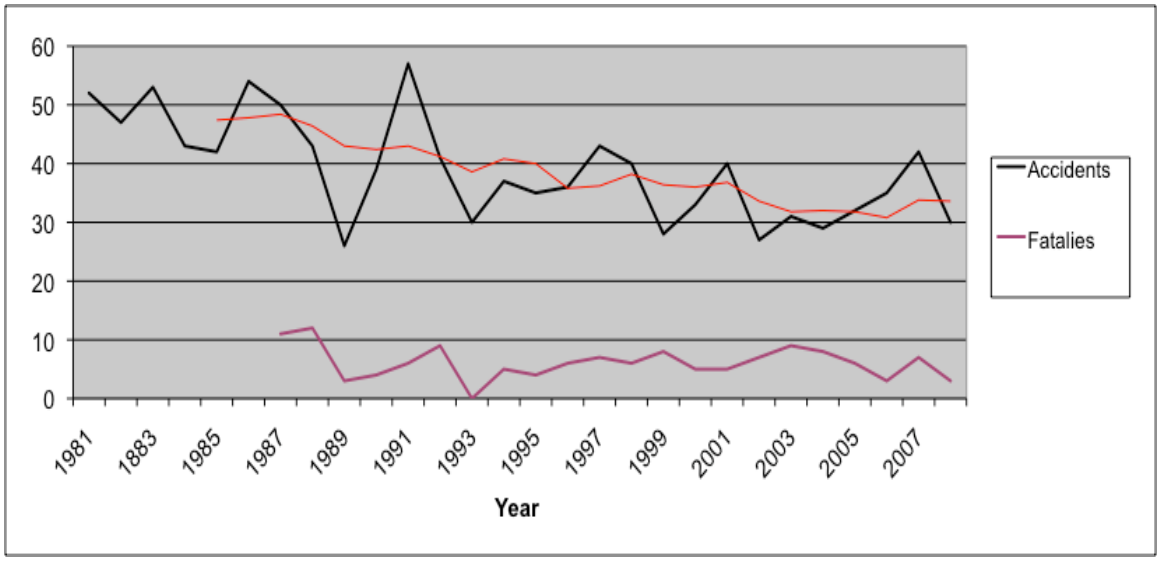


Figure 1 Number of total (with 5 year ave trend line) and fatal accidents on a per year basis.

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 red line overlaying the black Accident line shows the moving 5-year average number of accidents. This trend line shows a plateau is being reached. Breaking through this plateau will require a shift in

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

all our thinking and will require that clubs and commercial operators create a strong safety culture for US glider pilots. Increased rules and regulations may not provide the impetus for achieving this reduction. 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 making a significant long term reduction in the number of fatal soaring accidents.

FY08 ACCIDENT SUMMARY

NUMBER OF ACCIDENTS

For the twelve-month period ending October 31, 2008, twenty-six (26) gliders, five (5) motorgliders, and one (1) towplane were involved in thirty (30) separate accidents meeting the reporting requirements of NTSB Part 830 of the Code of Federal Regulation. This represents a 28.6% decrease in the number of accidents compared to the FY07 reporting period. The five-year average for the FY04 – FY08 reporting period is 33.6 accidents per year, representing a 0.6% decrease in the average number of accidents from the previous five-year period.

While the average number of accidents has shown a steady decline since 1981 (averaging 45.6/year in the 80's, 38.6/year in the 90's and 33.2/year so far this decade) the number of accidents each year remains unacceptably 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 FY08 reporting period three (3) accidents resulted in fatal injuries to the pilot. In addition, seven (7) pilots received serious injuries while twenty-two (22) pilots and thirteen (13) passengers received minor or no injuries.

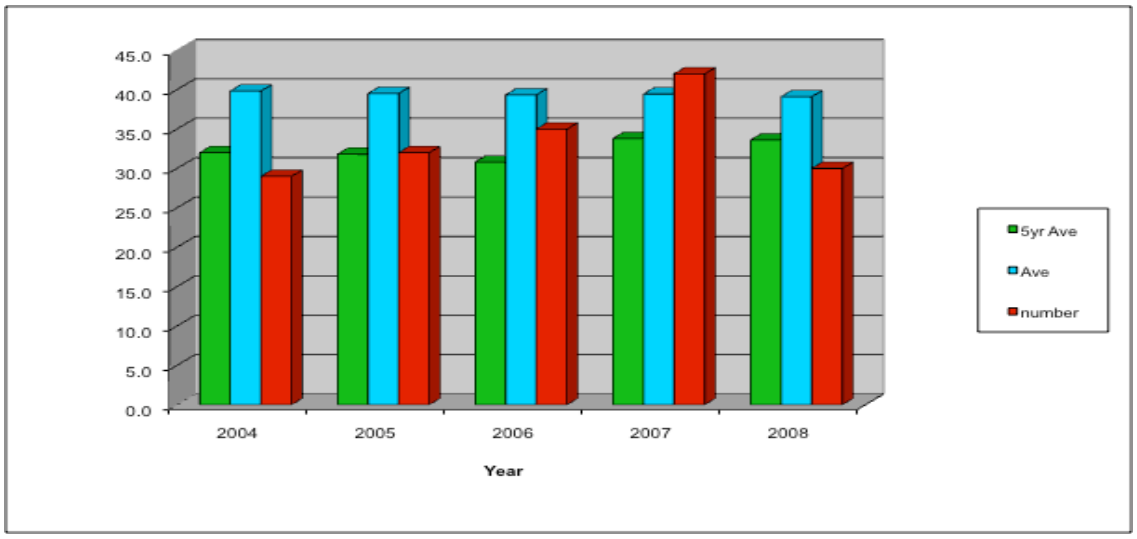
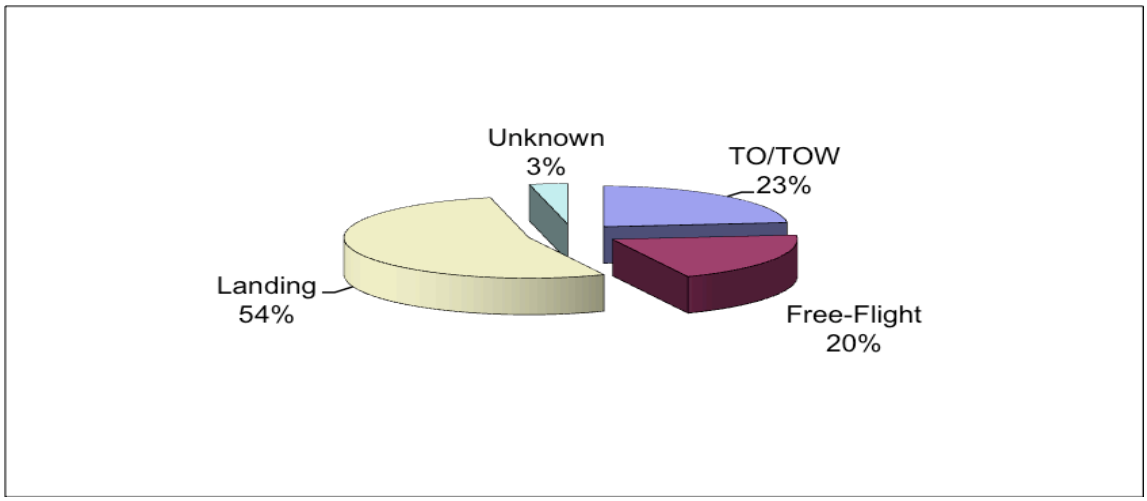


Figure 2 Number of accident, 5 year average 2004 - 2008

.

PHASE OF FLIGHT

The number of accidents that occur during the approach and landing phase of flight again far surpass those recorded during any other phase of flight. For the FY08 reporting period, approach and landing accidents attributed to approximately 54% of the total number of accidents reported for the year. This percentage represents a significant decrease from the 63% recorded during the FY07 reporting period. Takeoff accidents account for just over 23% of the number of accidents, meaning that over 77% of the number of accidents occurred during the takeoff and landing phase of flight.



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

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.

TAKEOFF ACCIDENTS

Premature termination of the tow (PT3) again accounted for five of the seven takeoff accidents that occurred during the FY08 reporting period. All of these accidents involved gliders being aerotowed. There were two motorgliders involved in takeoff accidents, in one case the glider pilot attempted to self launch with 1 aileron disconnected and in the other the engine quit when the glider reached 170 ft AGL.

The pilot and passenger of a Grob 103 were uninjured, but the glider was substantially damaged following a low altitude release. The pilot stated that he lost sight of the tow plane as they were climbing through 200 ft AGL. The glider pilot released and was unable to return to the runway. The glider ground looped after the left wing struck the ground *NTSB DEN08CA056*.

The pilot of an ASK-13 was seriously injured and the glider was substantially damaged following a low altitude release. The pilot reported that he was unable to prevent the glider from kiting after the towplane became airborne, so he released. The glider assumed a level pitch attitude and decelerated until a heavy landing occurred. After the exiting the glider the pilot noticed his hand-held radio lying on the floor. He stated that the radio had prevented him from being able to control the gliders pitch *NTSB CHI08136*.

The pilot and passenger of an ASK-21 were uninjured, but the glider was substantially damaged following a low altitude release. The pilot reported that the spoilers were not locked when the launch began. At 100 ft AGL the tow pilot gave the 'something's wrong with the glider signal'. The glider pilot misinterpreted the signal and activated the tow release and force-landed the glider in a field NTSB *SEA08CA129*.

The pilot of a SGS 2-33 was uninjured and the glider received minor damage following an un-commanded low altitude release. The pilot reported that the glider ballooned and drifted to the right during the take-off. Slack developed while attempting to reposition the glider resulting is an un-commanded release at 10 ft AGL. The pilot failed to deploy spoilers resulting in the glider rolling into the overrun area before sticking a rock *NTSB DEN08157*.

As can be seen by these accidents not every PT3 event comes as a 'surprise' to the glider pilot. In some cases the pilot chooses to terminate the tow because of the flight conditions while at other times equipment failure or accidental activation of the release leaves the glider without a tow plane. However, this should not mean that the glider pilot is without a plan of action. Pilots should practice, with a proficient instructor, how to respond to these various types of situations.

Another continuing cause for concern is pilots misinterpreting the tow pilot's in-flight signals. It appears the most glider pilots are 'geared up' for a 'release immediately' signal from the tow pilot, and will activate the release if ANY signal is given. Every glider pilot needs to recognize, and practice with a proficient instructor, how to respond to various signals. The SSF recommends that tow pilots not give the 'rudder waggle' signal at low altitudes if the tow plane is able to maintain or gain altitude. If possible, tow pilots should continue climbing while remaining close to the gliderport. The rudder waggle signal should be given at an altitude where the glider pilot may have some time to correct the situation if the tow release is activated.

Glider pilots must respond quickly and correctly to the tow pilot's signals. The rudder waggle signal was added to the standard SSA signals to allow the tow pilot to inform the glider pilot that 'something is wrong with the glider'. In most cases this could mean that the spoilers are open, but other conditions such as the tail dolly is still on or a disconnected spoiler has deployed, may also result in a rudder waggle signal being given. Upon seeing the rudder waggle signal the glider pilot should check the airspeed and climb rate of the tow, while verifying that the spoiler handle is in the closed and locked position. If everything appears to be normal, wait until the glider is in a position to safely return to the runway before activating the release. If the glider and tow plane are radio equipped, a brief call can be made to determine why this signal is being given.

In addition to practicing these 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

As noted in the FY07 annual report, ground launch operations are receiving more attention as fuel prices climb. The SSF Trustees have long advocated that all individuals involved in ground launch operations need adequate initial training and also a good program to maintain proficiency in this launch method. There were no ground launch accidents reported in the FY08 reporting period

INFLIGHT ACCIDENTS

In the FY08 reporting period, six accidents were reported during the in-flight (free flight) phase, after release and before entering the landing pattern. Two of these accidents were mid-air collisions one involved a glider and a tow-plane, the other involved 2 gliders in a thermal. Another two accidents occurred while gliders were ridge flying. In one accident the pilot was medically incapacitated and in the remaining accident the glider was observed at a low altitude just before impacting the terrain.

The private pilot was seriously injured and the Carat A motorglider was substantially damaged following a collision with terrain. A witness reported seeing the motorglider flying northeast at approximately 150 ft AGL. The witness turned away and upon turning back saw the motorglider 'nose-dive' into the ground. The glider impacted in a near vertical position and a post crash examination revealed that the spoilers were closed and the landing gear was extended *NTSB DFW08LA187*.

None of the pilots (commercial tow pilot, student glider pilot and glider flight instructor) were injured after a mid-air collision between a PA-25-235 Pawnee and SGS 2-33A substantially damaged the glider. The Pawnee had towed the 2-33 to an altitude of 3000 ft MSL when a normal release was performed. One minute after release, the Pawnee's right main gear struck the left side of the gliders vertical stabilizer and rudder *NTSB LAX08254A/B*.

The commercial pilot received minor injuries while the ASW-27B glider was substantially damaged following an in-flight collision with trees. The pilot reported that he was ridge flying back to the departure airport when he determined that he would no longer be able to make the destination airport nor could he return to a suitable landing site he had recently passed. The pilot slowed the glider down to 'fly into the trees'. The left wing struck trees causing the glider to fall to the ground, hitting on the right wing before coming to a rest inverted *NTSB NYC08217*.

The pilot of a Genesis 2 was seriously injured while the pilot of a Ventus 2A was not injured during a mid-air collision. The Genesis 2 was substantially damaged while the Ventus received minor damage. According to the pilots the Genesis was established in a right hand thermal with another glider when the Ventus entered the thermal at a lower altitude. The left wing of the

Ventus struck the right wing of the Genesis shortly after the pilot of the Ventus lost sight of the other gliders. The Genesis rolled inverted and the pilot bailed out, sustaining serious injuries during the parachute landing *NTSB DEN08LA137A/B*. [2]

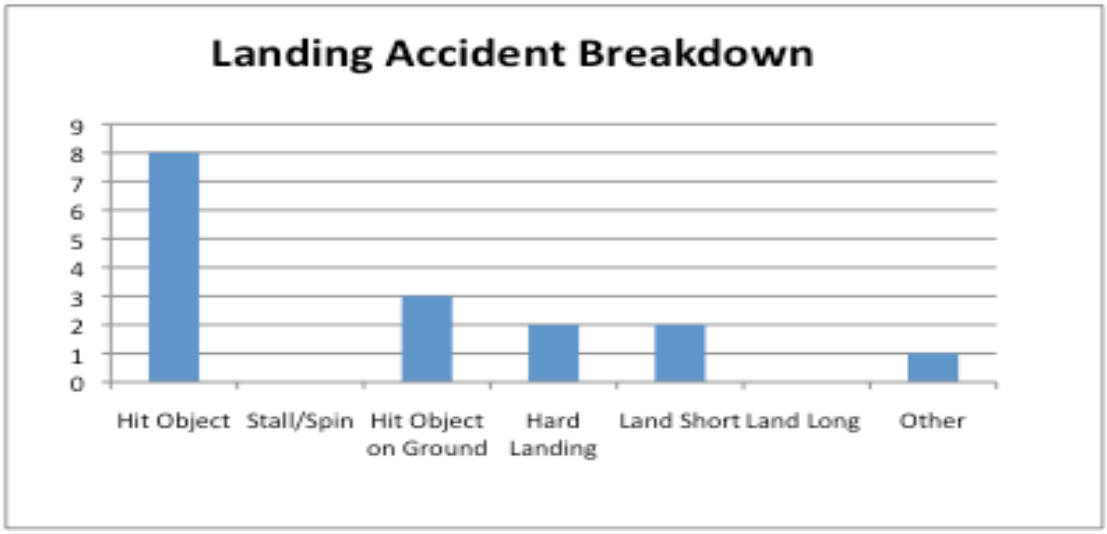
These accidents demonstrate the need to continuously evaluate how the flight is progressing and what options the pilot may have at his/her disposal. External or internal factors, such as pointing out objects on the ground, or handling multiple tasks while flying can lead to distractions. Fixations on 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.

It is also important to ensure that the glider is properly assembled before a flight is begun. Mis-assembly errors due to lack of familiarity or proficiency in the assembly process, or distractions during the assembly process are the major causes of these types of accidents. A post assembly inspection (Critical Assembly Check) and positive control check can aid the pilot in spotting problems that result from assembly errors. Finally, pre-flight planning and proficiency in the specific glider are important tasks that cannot be overlooked if safe flight is to be maintained.

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 FY08 reporting period, gliders hitting objects on final or during the landing roll accounted for the majority of the landing accidents. This was followed closely by land short, and hard landing accidents. The majority of the reported land short accidents occurred at the completion of local flights at the pilot's home airport. One important point to consider is that the higher the impact speed, the greater the chances of serious or fatal injuries occurring. A 50 kt impact contains 4 times as much energy as a 25 kt impact.

Accidents during the Approach and Landing Phase of Flight



[2] The NTSB report seems to indicate that the glider pilots in sanctioned contests are not allowed to communicate with each other. While position reporting for the purpose of helping pilots navigate is prohibited, the rules clearly encourage pilots communicate if safety issues arise.

The student and flight instructor were not injured while the Schweizer SGS 2-32 was damaged when it struck a sign and runway light during the landing roll. The student landed on runway 13 with a 30-37 kt wind from 110 degrees. The glider began to drift to the left while taxing off the runway on a high-speed taxiway. The left wing struck a sign and light damaging the left inboard aileron and leading edge back to the spar *NTSB SEA08LA067*.

The private pilot and flight instructor were not injured, but the Blanik L13 was substantially damaged when it impacted terrain short of the runway. The private pilot had not flown a glider for about 3 years, and was receiving a familiarization flight with an instructor. While in the pattern to land, the instructor realized the glider was low and assumed control. The glider struck a tree and came to rest about 100 ft short of the runway *NTSB NYC08LA168*.

The pilot received minor injuries and the Schleicher ASG-29 was substantially damaged when it landed hard short of the runway. The pilot was landing at the home airport after completing a cross-country flight. While on final the pilot reported encountering "very heavy sink, accompanied by a sharp drop in air speed" (ED: classic wind shear event). The pilot closed the spoilers and adjusted the pitch to increase airspeed, but was unable to continue the approach. A wing contacted the ground while the pilot was turning to avoid power lines. The glider touched down hard in flat open terrain several hundred yards short of the threshold *NTSB LAX08CA136*.

The pilot and ground crew were uninjured but the Genesis 2 glider was substantially damaged when the glider struck a golf cart. The glider had just completed a local flight and was landing on runway 7. While on the landing roll, a golf cart used to move gliders around the airport, drove onto the runway. The glider pilot attempted to turn, but was unable to avoid the collision. The golf cart was not equipped with a radio and failed to hear the glider pilot's announcements *NTSB CHI08CA202*.

The pilot received minor injuries while the Blanik L13 was substantially damaged when it struck a tree while landing at the departure airport. The glider was completing a local flight and the pilot prepared to land on a grass runway that paralleled the hard surface runway. The pilot extended the downwind to allow for spacing with an airplane landing on the hard surface runway. On base leg the glider pilot realized that he was too low and he decided to land in a field short of the grass runway. While maneuvering to land in the field, the glider struck a tree and cart-wheeled into the field *NTSB SEA08CA163*.

The pilot was uninjured but the Glasflugel H-301 glider was damaged when it landed hard on the airport runway. The pilot initiated the landing flare over the runway and reached over to retract the spoilers. The pilot retracted the flaps instead of the spoilers and the glider landed hard *NTSB MIA08CA194*.

The remaining landing accidents include problems associated with undershoots and off-airport landings. Note also, that all six accidents listed above occurred while the pilot was attempted to land on the home airport. Of the 14 gliders and 2 motorgliders involved in landing accidents 13 of them occurred while the pilot was attempting to land on an airport runway. Only 19% of the landing accidents occurred while the pilot was executing an off-airport landing.

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

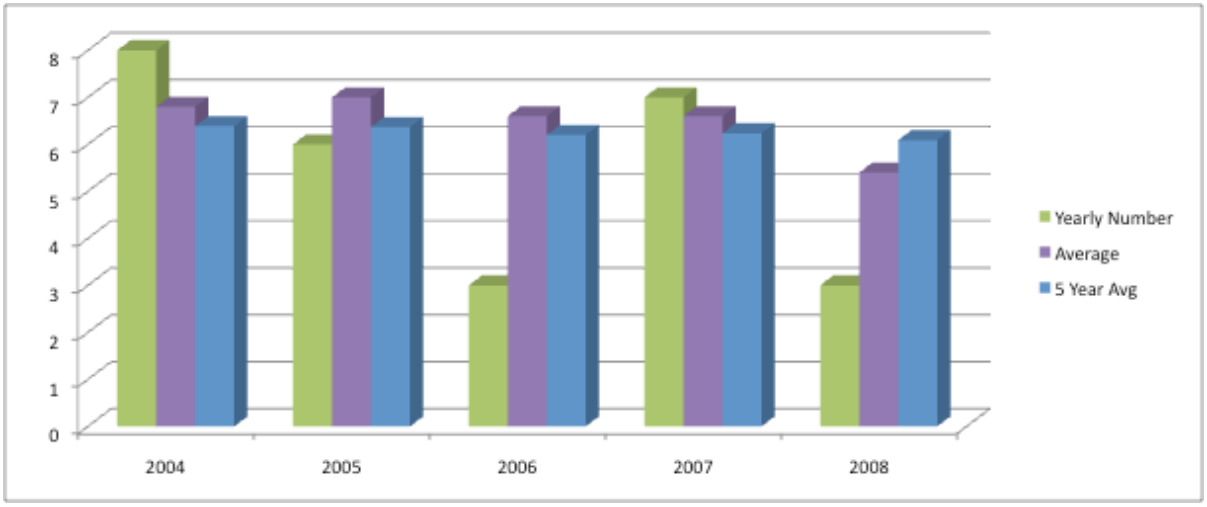
wind speeds can, and do, vary with altitude. A wind gradient is a gradual change in wind speed with altitude. When a gradient, or shear, is encountered the forces acting on the glider change and the glider responds to those changes.

One noticeable change is an increase in the gliders sink rate with a reduction in wind speed, resulting in a tendency to land short. All pilots need to be trained to recognize and respond to wind gradient/shear conditions. The SSF's goal orientated approach can help pilots accomplish this task.

FATALITIES

Three individuals were fatally injured participating in glider operations during the FY08 reporting period. This represents a significant decrease from the seven fatalities reported for the previous reporting period. It is also noteworthy that the majority of these fatalities occurred while the glider was in free flight, that is not involved in a launch or landing operation.

Summary of Fatalities



2004 – 2008

Two glider pilots and one motorglider pilot were involved in fatal accidents during the FY08 reporting period. Serious injuries to individuals participating in glider operations decreased slightly from the previous reporting period. Minor injuries to individuals involved in accidents decreased significantly.

The pilot of an AMS Flight APIS-M motorglider was fatally injured while attempting to land on an airport. According to witnesses, this was the pilot's second flight in the motorglider. While on short final about 300 ft AGL, the pilot was observed deploying the spoilers. The motorglider then began a left turn and crashed into wooded terrain short of the runway *NTSB MIA08LA131*.

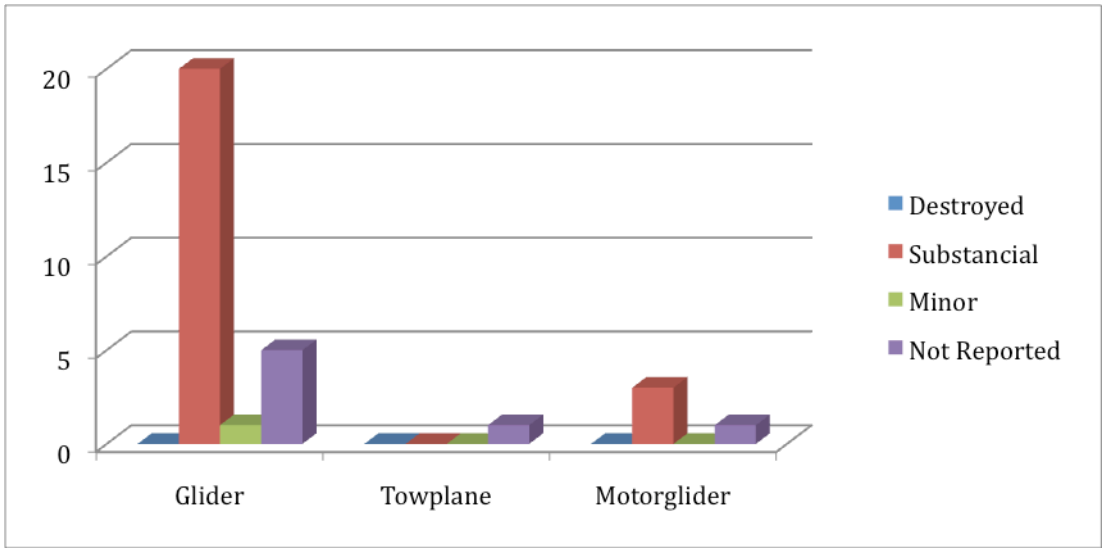
The commercial pilot of a Ventus A was fatally injured after impacting terrain approximately 2 miles south of the gliderport. The NTSB reported that the pilot lost control of the glider after suffering an incapacitating cardiac event *NTSB DEN08LA127*.

The commercial pilot of an ASW-20B was fatally injured when the glider impacted terrain during a cross-country flight. The GPS record of the flight indicates the glider was approximately 150 ft AGL traveling at a ground speed of 29 mph and descending at approximately 390 fpm just before the crash occurred *NTSB DFW08LA220*.

For the five-year period 2004 – 2008, 27 fatalities occurred. This equates to a five-year average of 5.4 fatalities per year a 22% decrease from the previous 5-year period. 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. In addition, while the trend for the number of accidents is moving in the right direction, the average number of fatalities is remaining constant.

DAMAGE TO AIRCRAFT

Twenty gliders and three motorgliders received substantial damage as a result of accidents in the FY08 reporting period. An additional six gliders, one motorglidre, and one tow-plane received minor or no damage during this reporting period.



Damage to Aircraft

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 one 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.

AUXILIARY-POWERED SAILPLANES

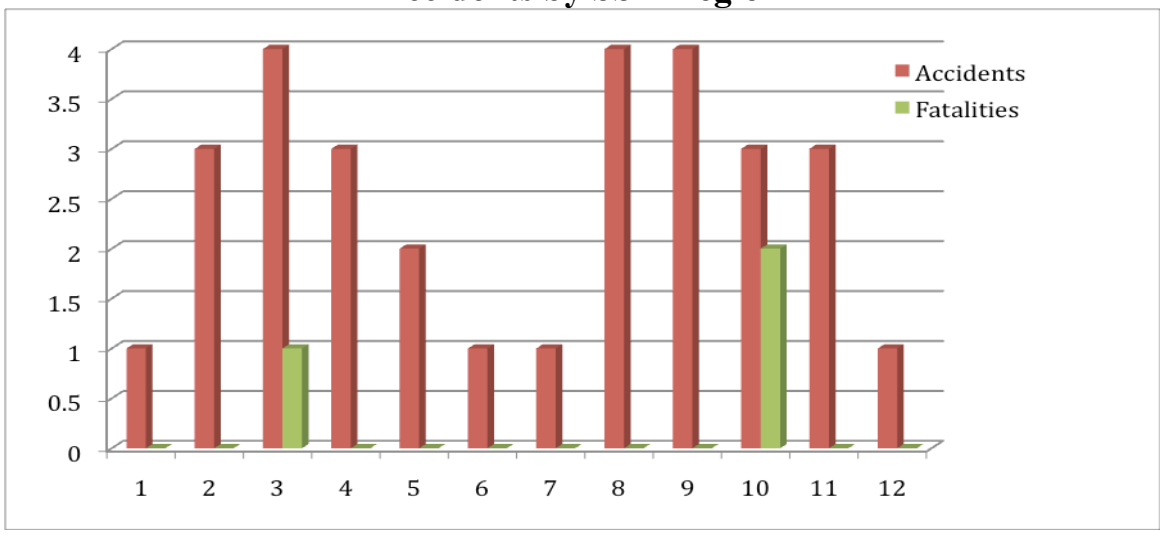
For the twelve-month period ending October 31, 2008, five accidents involving auxiliary powered sailplanes were reported to the National Transportation Safety Board. One pilot received fatal injuries, three pilots received serious injuries, while the remaining pilot was uninjured. This represents a substantial decrease (20%) in the number of accidents when compared to the previous reporting period.

ACCIDENTS INVOLVING TOW AIRCRAFT

During FY08, one accident involving tow aircraft occurred resulting in no injuries to the pilot. As noted above, tow-plane was involved in a mid-air collision with the glider it had just released. All tow-pilots need to be proficient in tow operations. Both the climb phase and descent phase of flight require pilots remain vigilant and visually scan for other traffic at all times. Having a standard set of procedures for this flight operation can help pilots maintain their situational awareness by recognizing when extra vigilance is required.

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[3].



FLIGHT TRAINING AND SAFETY REPORT

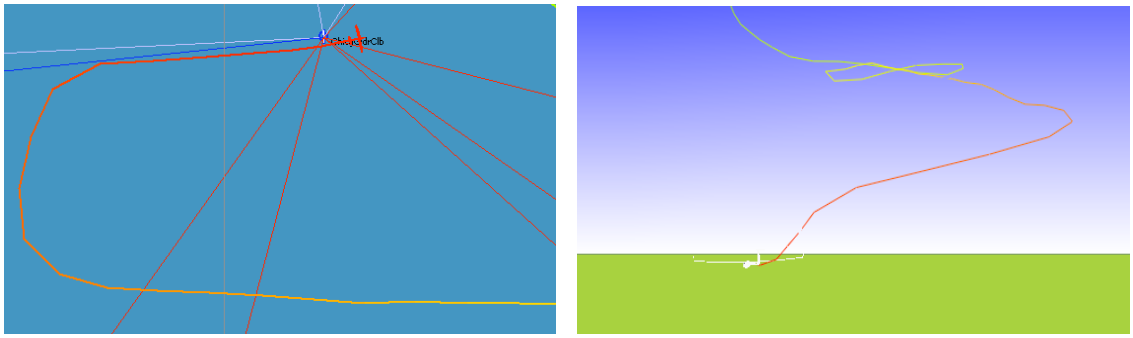
As the FY08 statistics show, the majority of soaring accidents continue to occur in the approach and landing phase of flight. For one reason or another, the pilot fails to make it to the landing area. Pilots need to consider multiple factors including: other traffic, wind, lift/sink, location, and distance remaining to the landing area in order to safely land a glider. Failure to account for one

[3] See Appendix A for more details

or more of these factors can leave the pilot low on the approach with very few corrective options available.

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. Work with a proficient instructor to learn ways to pick this initial angle.

Once a specific angle is selected, this angle should remain constant throughout the approach and landing. While most pilots will 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 turning the glider slightly toward the landing spot until the angle stops changing. If the angle starts to get steeper, then ease the spoiler handle back or slightly angle the glider away from the landing spot. By making a small adjustment at the first sign that the angle is changing, the glider pilot can remain on the proper glide-slope.



2D and 3D views of a glider landing showing pattern and decent profile

The SSF's goal orientated approach captures this idea and encourages pilots to focus on the primary objective when landing a glider. That objective is to put the glider on a predetermined spot to ensure a safe landing. Noticing when the descent angle changes, and acting accordingly can make this task much easier and will lead to more consistent landings.

One word of warning, this technique will require that the glider pilot modify the pattern slightly by adding a diagonal leg between the downwind and base legs. Pilots should consult a proficient instructor to learn this 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.

In FY08, takeoff accidents accounted for over 20% of the number of accidents. This is particularly frustrating because both glider and launch vehicle are sitting on the ground before the launch begins. Three accidents (60% of the 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 remind the pilot of the possibility of a launch emergency ("Are you ready for an emergency?") and be 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? Tow planes need a good rear view mirror, one that is located close to the tow pilot. Radios are highly recommended.

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.

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?

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 aviation 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 send the SSF trustees the number of annual number of launches and the total flight time that your club ships performed. This should easily come from your club records. If you also launch private gliders, then estimate the total flight time for these gliders. 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> Gene Hammond <grauchy at sbcglobal.com>, Bernald Smith <bernald at juggernaut.com>, or the generic SSF Webmaster <webmaster@soaringsafety.org>.

SSA REGIONS

Region 1	Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont.
Region 2	New Jersey, New York (south of 42nd parallel), Pennsylvania (east of 78th meridian).
Region 3	New York (north of 42nd parallel), Pennsylvania (west of 78th 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 92nd 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 92nd meridian), Nebraska Oklahoma, Texas.
Region 11	California (north of 36th parallel), Guam, Hawaii, Nevada.
Region 12	California (south of 36th parallel).

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.