SOARING SAFETY FOUNDATION

Nov 1, 2006 – Oct 31, 2007
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 FY07 (November 1, 2006 to October 31, 2007) reporting period. A review of the NTSB accident database shows US soaring accidents during this time period increased over 20% compared to the FY06 reporting period. FY07 also saw a 133% increase in the number of fatal accidents, ending a four year trend of decreasing fatalities. These numbers indicate that the US soaring community needs to rededicate itself to improving their soaring organizations operations. Only by instilling an "operational safety culture" can we reduce the number of accidents that impact us all.

For the twelve-month period ending October 31, 2007, thirty-eight (38) gliders, six (6) motorgliders, one (1) towplane, and one (1) airplane were involved in forty-two (42) separate accidents meeting the reporting requirements of NTSB Part 830 of the Code of Federal Regulation. This represents a 20% increase in the number of accidents compared to the FY06 reporting period. The five-year average for the FY03 – FY07 reporting period is 33.8 accidents per year, representing a 9.7% increase in the number of accidents from the FY02 – FY06 reporting 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 33.6/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 FY07 reporting period seven (7) accidents resulted in fatal injuries to the pilot. In addition, eight (8) pilots received serious injuries while thirty-five (35) pilots and four (4) passengers received minor or no injuries during the FY07 reporting period.

A review of the fatal accidents shows that thermaling close to the ground can be a deadly activity. Of the seven fatal accidents in the FY07 reporting period, 43% of them occurred when the glider was in free flight, and evidence indicated the glider stalled/spun into the ground. Two additional fatal accidents occurred during the aerotow launch phase of flight and evidence also indicated that a stall/spin condition lead to the fatal crash. Thus stall/spin conditions were a causal factor in over 70% of the fatal accidents.

Of major concern is the continuing high percentage, over 63%, of accidents that occur during the landing phase of flight. It should also be noted that of the twenty-nine (29) landing accidents, twenty-two (22), or 68%, of them occurred while the pilot was attempting to land on an airport. Twelve (12) 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 eight (8) of those accidents. Two landing accidents occurred when the pilot overshot the intended landing area, once during an off-airport landing, and the other following an encounter with a thermal on short final.

Pilots should consider that there are numerous 'tools' or maneuvers that can be used to correct an overshoot condition. These include slips (forward and turning), more spoilers, full spoilers plus increased airspeed, and 'S' turns on final. These flight maneuvers increase the sink rate of the glider – allowing for a steeper approach, or increase the flight time – allowing the glider to lose more altitude. In contrast closing the spoilers and increasing the airspeed is the only available 'tool' when the undershoot condition is detected. Pilots should practice, with a qualified instructor, the techniques and maneuvers needed to land safely from an overshoot condition, and they should refrain from putting themselves in an undershoot position.

Proper training and repeated practice are two important tasks that a glider pilot can practice to master the skills needed to safely land a glider. Pilots and instructors should also consider using a low-cost GPS data logger as a training aid to help evaluate these landing skills. Low-cost hand-help GPS units are available on the used market and they can be carried in the training glider. The approach and landing portion of the flight can be extracted from the logger 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.

Takeoff accidents, accounted for 20% of the FY07 accidents. Both PT3 (Premature Termination of The Tow) and motorglider go-around accidents occurred in the FY07 reporting period. In FY07 nine (9) accidents occurred during the take-off phase of flight. One (1) tow-plane and five (5) gliders being aerotowed and three (3) gliders on ground launch 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.

Six (6) motorgliders were involved in a variety of accidents in the FY07 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.

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ANNUAL SAFETY REPORT
FY 07

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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.

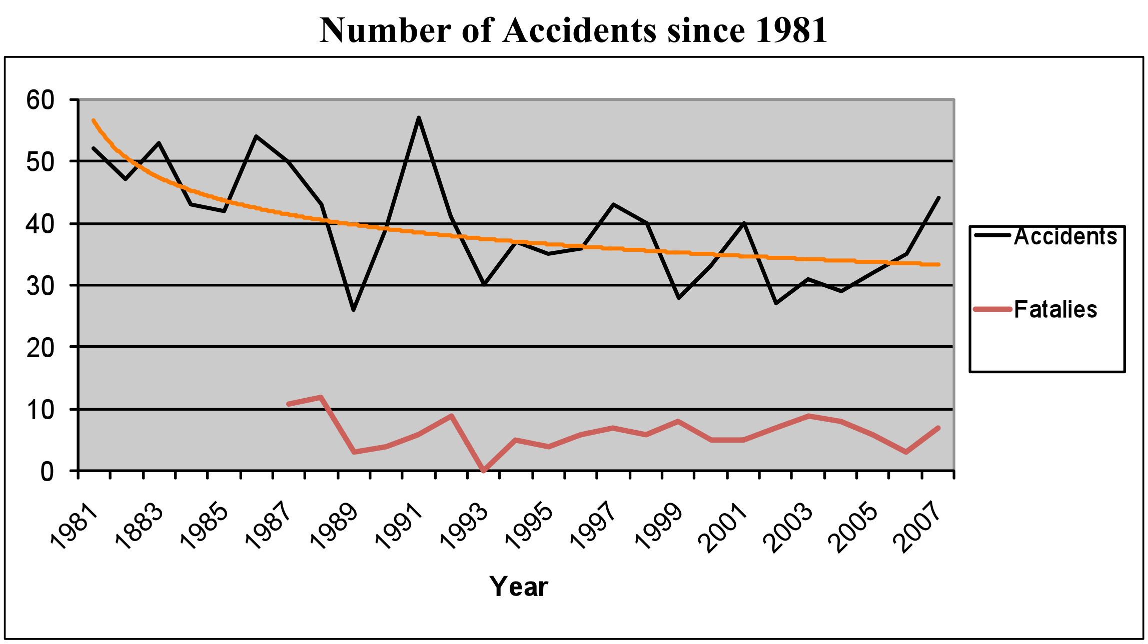

Figure 1 Number of total and fatal accidents on a per year basis.

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. While the overall trend is good, the graph clearly shows a plateau is being reached. Breaking through this plateau, by creating a strong safety culture, is a major challenge for US glider pilots. Increased rules and regulations may not provide the impetus for achieving this reduction. A safety culture requires

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

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.

FY07 ACCIDENT SUMMARY

NUMBER OF ACCIDENTS

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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 34.1/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 FY07 reporting period seven (7) accidents resulted in fatal injuries to the pilot. In addition, eight (8) pilots received serious injuries while thirty-five (35) pilots and four (4) passengers received minor or no injuries during the FY07 reporting period.

Number of Soaring Accidents

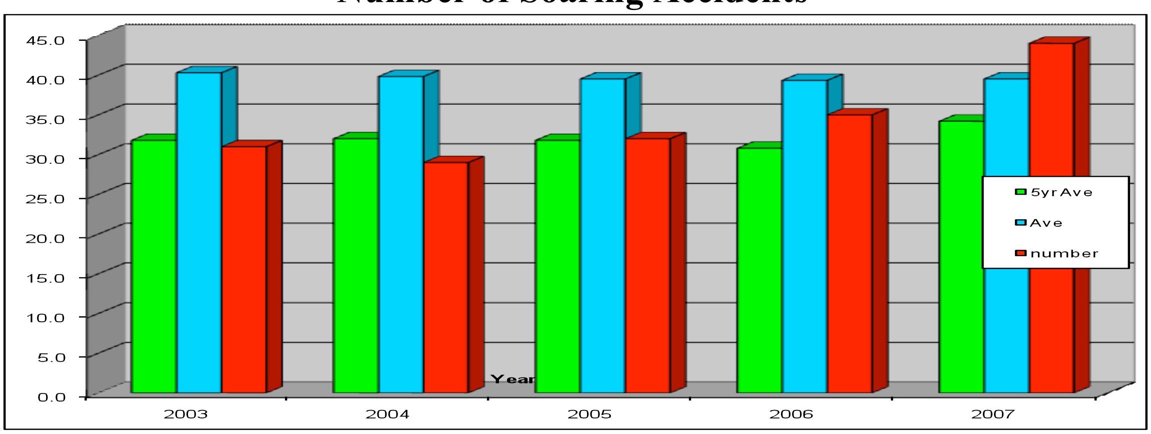

Figure 2 Number of accident, 5 year average 2003 - 2007

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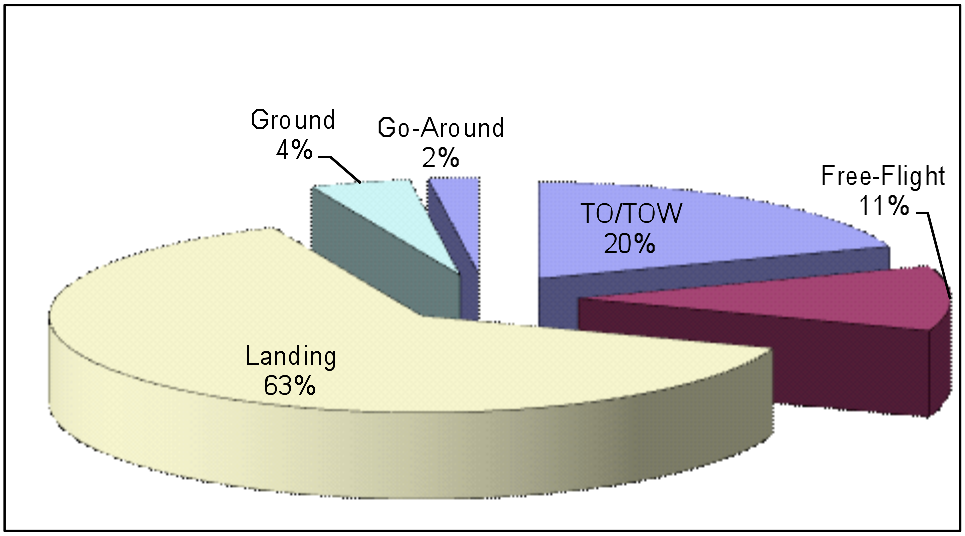
PHASE OF FLIGHT

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 reporting period, approach and landing accidents attributed to approximately 63% of the total number of accidents reported for the year. This percentage represents a slight increase from the 60% recorded during the FY06 reporting period. Takeoff accidents account for just over 20% of the number of accidents, meaning that over 83% 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 eight of the nine takeoff accidents that occurred during the FY07 reporting period. Five of these involved gliders being aerotowed, three involved gliders being ground launched and one involved a towplane. There were no motorgliders involved in takeoff accidents, however one motorglider was damaged during a go-around following an aborted landing attempt.

The CFIG and student were not injured, but the Schweizer SGS2-33 glider was substantially damaged after striking corn stalks after an aborted launch. The glider was positioned for launch with the left wing tip wheel resting in tall grass. As the launch started the drag from the grass caused the glider to veer to the left. The instructor released but was unable to stop before the glider entered the cornfield on the left side of the runway *NTSB DFW07LA157*.

The private pilot and his passenger were not injured, but the I.A.C.-Brasov IS-28B2 glider was substantially damaged when it struck a parked glider during a forced downwind landing. The pilot reported that he was attempting to return to the runway following a towrope failure at 500 ft AGL. The pilot landed downwind with a 15-21 kt tailwind, and lost control during the final portion of the landing roll. The glider came to a stop after hitting a parked glider *NTSB LAX07CA176*.

The pilot of a Discus-CS was not injured, but the glider was damaged when it struck trees following a low altitude release. The pilot reported that he encountered heavy turbulence soon after the launch began. The pilot reported bumping his head on the canopy several times before accidently bumping the tow release handle, actuating the release mechanism at 200 ft AGL. The glider struck trees while the pilot was maneuvering to make a downwind landing. *NTSB ATLA07CA101*.

The pilot of a Slingsby Swallow T.45 glider was seriously injured and the glider was substantially damaged following an aborted aerotow launch. Witnesses reported seeing the glider perform a series of rapid oscillations in pitch (PIOs) during the initial climb period. The pilot released and was maneuvering the glider for a downwind landing when it was appeared to stall and impact the terrain *NTSB DEN07LA152*.

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 current instructor, how to respond to these various types of situations. In addition, the pilot and instructor can simulate numerous situations and talk through the possible solutions without actually flying a glider. 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

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. Despite the low number of ground launches, compared to aerotow launches, the FY07 reporting period shows three of eight (38%) of the launch accidents occurred during ground launch operations. The SSF will continue to monitor this launch method to determine how to keep it as safe as possible.

The CFIG was seriously injured while the pilot-rated student was not injured when the Schweizer SGS 2-33 landed hard after a cable break. The instructor reported that the pilot-rated student was at the controls when the cable broke at 40 ft AGL. The student lowered the nose but the glider did not have sufficient energy to complete the landing flair to prevent a hard landing *NTSB MIA07LA041*.

The commercial pilot received serious injuries and the Schweizer SGS 2-32 glider was substantially damaged during a failed winch launch. The pilot reported that during his second launch of the day and at 700 ft AGL the glider began to loose airspeed. The pilot made several unsuccessful attempts to get the winch driver to increase speed and then attempted to abort the launch. At 400 ft AGL, the pilot noticed that the cable was still attached, even though he had pulled the release several times. The pilot was unable to break or release the cable and the glider struck the ground in a steep nose down attitude *NTSB LAX07CA086*.

The private pilot of a Schewizer SGS 2-33 was not injured but the glider was substantially damaged following a collision with a truck during an aborted winch launch. Witnesses reported that the launch was proceeding normally when the cable broke at 300 ft AGL. The solo pilot attempted to fly an abbreviated pattern but was unable to line up with the runway. The glider landed across the runway and travelled another 75 ft past the runway edge before striking a parked truck *NTSB LAX07CA172*.

As these accidents show, ground launch procedures require training and proficiency on the part of pilots, ground crew, and the tow vehicle or which driver. While pilot training is regulated by the FAA, ground crew and tow vehicle/winch driver training is not. All clubs, commercial operators, and individual pilots are encouraged to seek experienced individuals to obtain this essential training.

INFLIGHT ACCIDENTS

In the FY07 reporting period, five accidents were reported during the in-flight (free flight) phase, after release and before entering the landing pattern. These accidents typically result in high-speed impacts with terrain, and often result in fatal injuries to the pilot. Of the five accidents in this reporting period four of them (80%) resulted in fatal injuries to the pilot. It should also be noted that stall/spin conditions existed in the majority of these fatal accidents.

The commercial pilot was fatally injured and the ASH-26E motorglider was damaged following a stall/mush collision with terrain. After 4 hours on a X-C flight the motorglider was observed to enter what appeared to be a left thermaling turn. The ground scars indicate that the glider stalled and mushed into the ground in a nose low, left wing low condition *NTSB DEN07FA089*.

The private pilot was fatally injured and the SZD-36A glider was substantially damaged following an in-flight separation of the wings. The glider had been assembled for flight and the pilot had been aloft for 30 minutes when it was observed that the wings folded. Examination of the wreckage showed that the left wing lower attach pin had failed to enter the lower attachment hole. The mis-assembly allowed the left wing to raise up 45 deg before the upper attach lug failed and the wings departed the fuselage *NTSB ATL07LA066*.

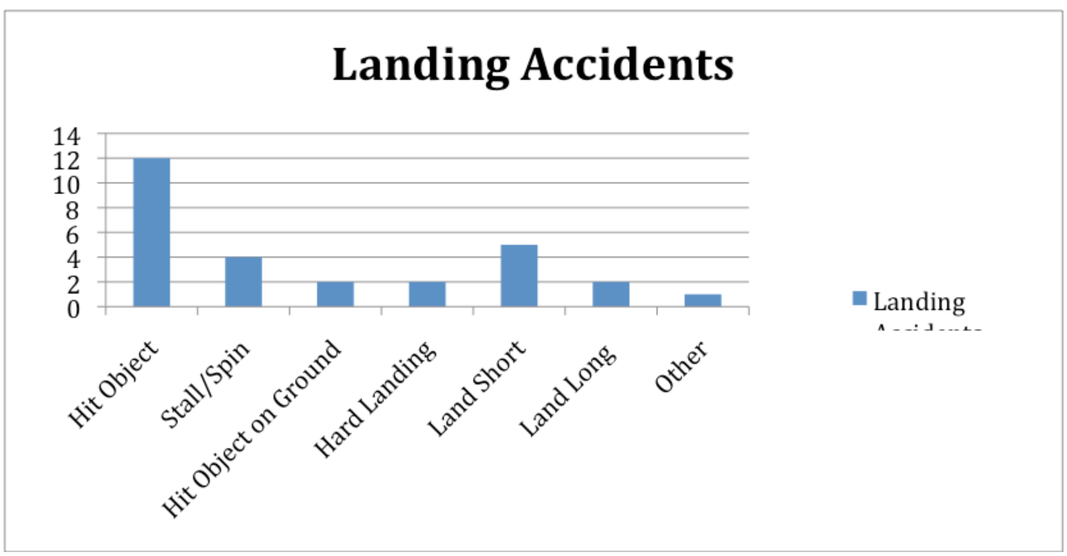
The private pilot received serious injuries and the LS8-18 glider was substantially damaged following an in-flight collision with terrain. The pilot was attempting a world record distance flight in 15-meter class along the Appalachian Mountains. The pilot reported that in cruise flight at ridge-top level the glider encountered sheer or rotor winds. There was a sudden loss of control effectiveness and the glider impacted the ridge. The pilot was located a day after the accident occurred *NTSB NYC07LA095*.

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 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 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 a majority of injuries to pilots and damaged or destroyed gliders. For the FY07 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 stall/spin, 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

The pilot received minor injuries and the Nimbus 3DM motorglider was damaged when it struck a ditch and fence during an off-airport landing. The pilot reported that he had been airborne for

30 minutes when 'severe downdrafts' forced him to make an off-airport landing. The motorglider collided with a ditch and fence during the landing roll *NTSB SEA07CA162*.

The pilot was uninjured, but the ASW-24E motorglider was received major damage when the left wing contacted the ground while making the base-to-final turn. The pilot reported that he had not flown the motorglider for 2 years and he intentionally returned to the airport because he was not flying well. He was low in the pattern and he also failed to maintain airspeed as the motorglider descended. The left wing tip stuck the ground with the pilot was attempting to complete the base-to-final turn *NTSB MIA07CA151*.

The pilot and passenger were not injured, but the ASK-13 glider was damaged after striking 75 foot tall trees near the approach end of the runway. The pilot reported that while on downwind of his second flight he noted a change in wind speed and direction. He attempted to abbreviate the pattern, but failed to clear the tall trees just east of the runway centerline due to wind shear conditions *NTSB CHI07CA040*.

The pilot and passenger of a Schweizer SGS 2-32 were seriously injured and the glider was damaged after the left wing struck trees during an off-airport landing. The pilot was conducting a local soaring flight and after 30 minutes aloft conditions changed causing the pilot to attempt an off-airport landing in a cornfield. The left wing struck trees about 6 ft inboard from the tip while the pilot was making the base-to-final turn *NTSB NYC07CA060*.

The private pilot received minor injuries while the Club Astir IIIB glider was substantially damaged after the glider collided with flat desert terrain at the approach end of the runway. The pilot reported that he was unable to find any lift so he entered the pattern to land back at the airport. He noticed another glider on the runway preparing to take-off so the pilot extended the downwind leg and decided to land on the parallel taxiway. The pilot was unable to reach the intended landing area and landed the glider 300 yards short in unimproved terrain *NTSB LAX06CA149*.

The pilot was not injured but the Pegasus 101C glider was substantially damaged when the glider touched down short of the intended landing spot. The pilot reported that surface winds were light while he was attempting to land the pilot reported encountering 'heavy sink' between 25-50 ft AGL (most likely a wind shear event). The glider just crossed a ditch perpendicular to the runway then dropped the right wing striking a runway marker *NTSB DEN07CA092*.

The CFIG and student were not injured but the Blanik L-23 glider was substantially damaged when it landed hard about 100 ft short of the runway. The instructor reported he took control of the glider on downwind when turbulence from an approaching rain shower was encountered. The instructor reported flying the pattern at 70 kts with full spoilers because the 'glider was not descending'. After turning final the glider encountered a wind shear event and the instructor was unable to reach the runway, landing about 100 ft short *NTSB NYC07CA151*.

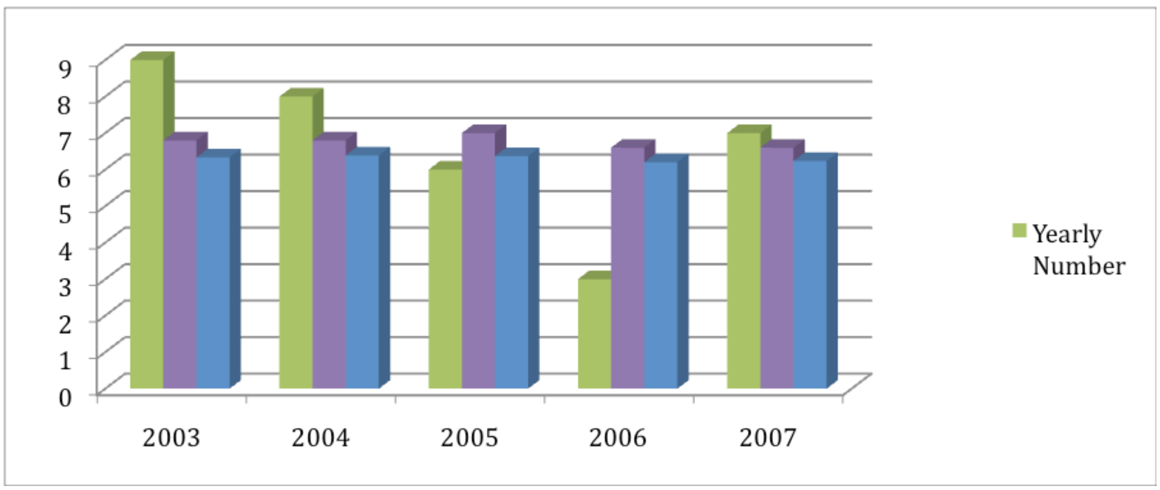
The remaining landing accidents include problems associated with stall/spin, hard landings, undershoots, and overshoots. Note also, that of the 7 accidents listed above, 5 of them occurred while the pilot was attempted to land on the home airport. Of the 27 gliders and 2 motorgliders involved in landing accidents 22 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. 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

Seven individuals were fatally injured participating in glider operations during the FY07 reporting period. This represents a significant increase from the three 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
2003 – 2007

Four glider pilots, one tow pilot, and two motorglider pilots were involved in fatal accidents during the FY07 reporting period. Serious injuries to individuals participating in glider operations increased slightly from the previous reporting period. Minor injuries to individuals involved in accidents decreased significantly.

The private pilot was fatally injured and the Ventus CM motorglider was destroyed upon impact with mountainous terrain. Friends of the pilot reported that he departed on a X-C flight with 4 other gliders. The last transmission from the accident pilot stated that he was at 16,700 ft near the north end of the White Mountains *NTSB SEA07FA231*.

The commercial pilot was fatally injured and the Bellanca 7GCAA was destroyed upon impact with terrain during a glider aerotow operation. Witnesses reported seeing the tailwheel shimmy back and forth before the towplane began to veer to the right. The glider pilot released and landed straight ahead while the towplane departed the right side of the runway. The towplane then entered a steep climb to avoid trees. The towplane then rolled right and impacted the ground in a near vertical decent *NTSB MIA08LA002*.

The private pilot was fatally injured while the Grob Speed Astir II was substantially damaged following impact with terrain. The purpose of the flight was an aerotow retrieve from a public airport. Witnesses reported that glider lifted off and climbed to an altitude of 20-50 ft AGL at which point the glider pilot apparently activated the tow release. The tow pilot felt the release and continued the take-off to clear the runway for the glider. According to witnesses, the glider stalled and rolled right reaching an attitude where the wings were perpendicular to the ground. The right wing contacted the ground and the glider cart wheeled onto its nose before coming to rest inverted *NTSB NYC07LA155*.

The private pilot was fatally injured and the Grob G102 ASTIR CS was substantially damaged upon impact with trees while on final. Witnesses reported that the pilot reported entering a downwind leg to land at the local gliderport. While on final at approximately 200 ft AGL the glider was seen to suddenly pitch down and enter a vertical decent. It appeared that no attempt was made to raise the nose during this decent *NTSB MIA07LA121*.

The private pilot was fatally injured and the Ventus B/16.6 glider was destroyed upon impact with mountainous terrain. After a normal tow the glider released and the towplane returned to the gliderport to tow another glider to the same area. Upon returning with the second glider the pilots made several unsuccessful attempts to contact the accident pilot. The wreckage was found the following day in tree-covered mountainous terrain near the release point. The glider impacted in a near vertical nose-low attitude *NTSB DEN08LA017*.

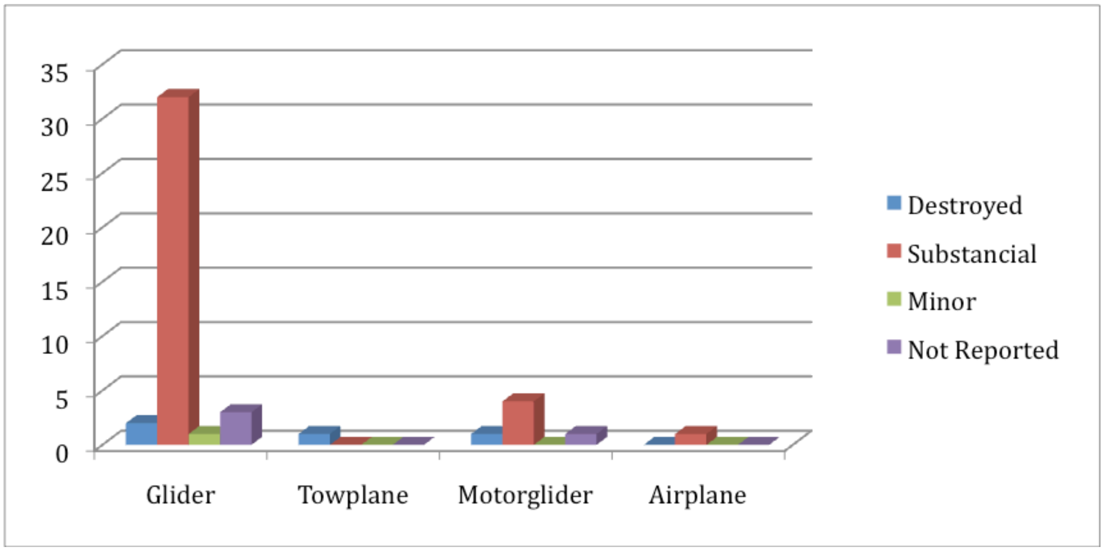
For the five-year period 2003 – 2007, 33 fatalities occurred. This equates to a five-year average of 6.6 fatalities per year a slight decrease from the previous 5-year period. While the 5 year average is down from the initial rate of 7.2 fatalities per year recorded in 1991, the long term trend is not encouraging. In addition, while the trend for the number of accidents is moving in the right direction, the number of fatalities is remaining constant.

An analysis of the accident data in the FY07 reporting period shows that stalls and stall/spin events were a causal factor in 71% (5 of 7) of the fatal accidents. Two commercial rated and five private rated pilots were involved in these fatal accidents. Two accidents occurred during launch operations while the remaining five occurred while the glider was in free flight. The majority of these free flight accidents occurred when the glider pilot appeared to be attempting to thermal at a low altitude. One accident occurred following the miss-assembly of the glider.

Attempting to thermal close to the ground exposes the pilot to high risk where the risks may greatly exceed the rewards. Thermals are typically small close to the ground causing the glider to repeatedly enter and leave the updraft. This causes sudden changes in angle of attack, resulting in pitch changes that the pilot must compensate for. The pilot's ability to recover from a thermal induced stall is seriously degraded due to the lack of altitude. Maintaining extra speed and recognizing when thermal flight should be terminated are two options that all glider pilots must carefully consider during every flight. Setting, and respecting, a personal low altitude limit where thermal flight will not be conducted is one way of preventing these types of accidents.

DAMAGE TO AIRCRAFT

Two gliders, one towplane, and one motorglider were reported destroyed while thirty-two gliders and four motorgliders received substantial damage as a result of accidents in the FY07 reporting period. An additional five gliders and motorglidres receive 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 the long term impact can not 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 operations 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 pilots or passengers safety.

AUXILIARY-POWERED SAILPLANES

For the twelve-month period ending October 31, 2007, six accidents involving auxiliary powered sailplanes were reported to the National Transportation Safety Board. Two pilots received fatal injuries, one pilot received minor injuries, while the remaining three pilots were uninjured. This represents a slight decrease (14%) in the number of accidents when compared to the previous reporting period.

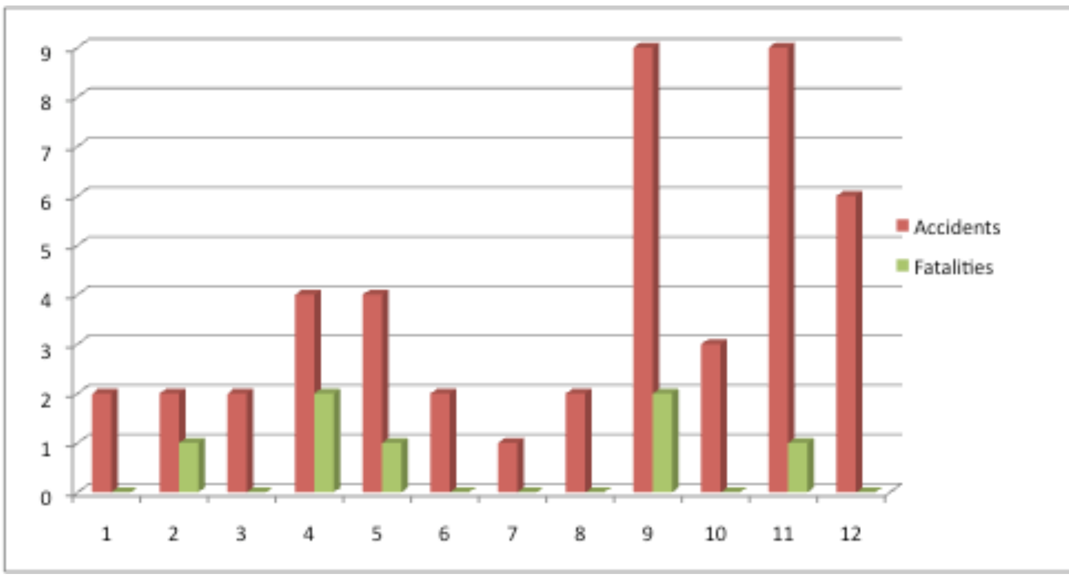
One of these accidents occurred when the pilot decided to abort the landing and attempted a go-around. One accident occurred when an airplane taxied over the wingtip of a motorglider as it was idling on the ramp waiting to taxi out for its flight. Two accidents occurred while the pilot was attempting to land with the engine stowed, in one case the glider landed short of the runway and in the other the glider struck a ditch and fence during an off-airport landing. The remaining two accidents, both fatal, occurred while the glider was in free flight.

ACCIDENTS INVOLVING TOW AIRCRAFT

During FY07, one accident involving tow aircraft occurred resulting in fatal injuries to the pilot. As noted above, the glider released after noticing a problem with the towplane. The towplane departed the right side of the runway and crashed while attempting to avoid trees.

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].



Accidents by SSA Region

FLIGHT TRAINING AND SAFETY REPORT

A review of the FY07 fatal accidents shows that thermaling close to the ground can be a deadly activity. Of the seven fatal accidents in the FY07 reporting period, 43% of them occurred when the glider was in free flight, and evidence indicated the glider stalled/spun into the ground. Two additional fatal accidents occurred during the aerotow launch phase of flight and evidence also indicated that a stall/spin condition lead to the fatal crash. Thus stall/spin conditions were a causal factor in over 70% of the fatal accidents.

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[2] See Appendix A for more details

As the FY07 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.

Pilots should consider that there are numerous 'tools' or maneuvers that can be used to correct an overshoot condition. These include slips (forward and turning), more spoilers, full spoilers plus increased airspeed, and 'S' turns on final. These flight maneuvers increase the sink rate of the glider – allowing for a steeper approach, or increase the flight time – allowing the glider to loose more altitude. In contrast closing the spoilers and increasing the airspeed is the only available 'tool' when the undershoot condition is detected. Pilots should practice, with a qualified instructor, the techniques and maneuvers needed to land safely from an overshoot condition, and they should refrain from putting themselves in an undershoot position.

One approach to this is the SSF's 'goal oriented' approach technique that requires the pilot, student or otherwise, to continuously evaluate the gliders altitude, position, speed, and direction to determine if it can successfully reach the intended landing spot. If that goal is in doubt, the pilot should change the glider's path or configuration to reacquire the goal. If it becomes impossible to reach the goal, a new landing spot should be selected and the process begun again.

Another tool that pilots and instructors should consider is that GPS recorder you installed to document your flight. Low-cost hand-help 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 FY07, takeoff accidents accounted for over 20% of the number of accidents including 29% of the fatal accidents. This is particularly frustrating because both glider and launch vehicle are sitting on the ground before the launch begins. In FY07 five accidents (56% 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 which 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.