SOARING SAFETY FOUNDATION

Nov 1, 2005 – Oct 31, 2006
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.

The compilation and dissemination of accident data have become one of the Soaring Safety Foundation's most important functions. Analysis of this information is crucial because it allows the SSF to identify and evaluate emerging accident trends within the soaring community. It also focuses accident prevention resources on specific problem areas that have a negative impact on the safety of our sport.

Accident data included in this report was obtained from two primary sources: the National Transportation Safety Board (NTSB) accident reports 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

In previous years, this report has been issued on the basis of a review of accidents that occur during a calendar year (Jan 1 to Dec 31). This schedule makes it difficult to review every accident and analyze the accident trends to get a summary of this report into the spring issue of SOARING magazine. These factors have caused the SSF to revise the review period moving it to a Fiscal Year (November 1st of the preceding year to October 31st of the current year). This report covers the Fiscal Year 2006 (November 1, 2005 to October 31, 2006). The analysis and trend data in this report now use this FY06 reporting period. Data from previous years has been converted to FY0x reporting periods, making it possible to continue the 5 year analysis trends.

A cursory look at the FY06 soaring accident rates shows both good and bad news. The bad news is that the number of accidents increased slightly, from 32 in FY05 to 35 in FY06. The good news is that there were 50% fewer fatalities than in FY05.

It is certainly too soon to determine if this is a trend or a blip in our statistics, but pilots should note that in 1993 there were zero fatalities, and the SSF trustees see no reason why we can't achieve this goal again. Every US glider pilot should dedicate themselves to the goal of making a significant long term reduction in the number of fatal soaring accidents.

For the twelve month period ending October 31, 2006, 36 gliders, motorgliders, towplanes, or airplanes were involved in accidents meeting the reporting requirements of Part 830 of the Code of Federal Regulations were reported to the National Transportation Safety Board. This represents a 9.5% increase in the number of accidents compared to the FY05 reporting period. While the number of accidents increased from FY05 to FY06, the five-year average for the FY2002 – FY2006 reporting period is 30.8 accidents per year. The average number of accidents for the previous 5 year period (FY-2001-FY2005) was 31.8 accidents per year, representing a 3% decline in the five-year average.

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 32.4/year so far this decade) the yearly number of accidents remains unacceptably high. In addition, the average number of fatalities has remained around 6 per year since the mid 1990's. In the FY06 reporting period 3 accidents resulted in fatal injuries to the pilot. In addition to these three fatalities, seven pilots received serious injuries while twenty-three pilots and eight passengers received minor or no injuries. Continuing a trend from the FY05 period, no tow plane pilots received fatal injuries in accidents involving those aircraft.

Of major concern is the mid-air collision between an ASG-29 (officially ASW 27-18) glider and a corporate Hawker 800XP biz-jet. While the accident resulted in only minor injuries to 2 of the pilots and no injuries to the jet's co-pilot or passengers, both aircraft were substantially damaged in the collision. The glider pilot bailed out while the jet made an emergency gear-up landing at the nearest airport. All pilots should exercise extra vigilance when operating in mixed traffic areas.

As the FY06 statistics show, the majority of soaring accidents 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 - leading to an undershoot, or too high on the approach – leading to an overshoot.

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 are the only available 'tools' 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 new tool that pilots and instructors should consider is that low-cost hand-held GPS flight recorders can be used in flight training. The approach and landing portion of a training 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 pilots' traces from multiple Internet web sites (e.g., OLC) and examine how others tackle this demanding task. Comparing your landing trace to peers can help determine what is needed to reduce the number of landing accidents as well as improve individual flying skills.

Takeoff accidents, though rare, are particularly frustrating because they are usually avoidable as both glider and launch vehicle are sitting on the ground before the launch begins. In FY06 seven accidents occurred during the take-off phase of flight. Two motorgliders, four gliders being aerotowed, and one glider on a winch launch were involved in take-off accidents. Pilots should mentally prepare for an emergency during the take-off before every flight. This includes developing a specific set of action plans to deal with several contingencies. The task is then to, if necessary, 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 Crew Resource Management (CRM) 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 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 also highly recommended.

Seven motorgliders were involved in a variety of accidents in the FY06 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
FY06

An examination of the FY06 soaring accident rates shows both good and bad news. The bad news is that the number of accidents increased slightly, from 32 in FY05 to 34 in FY06. The good news is that there were 50% fewer fatalities than in FY05.

It is certainly too soon to determine if this is a trend or a blip in our statistics, but pilots should note that in 1993 there were zero fatalities, and the SSF trustees see no reason why we can't achieve this goal again. Every US glider pilot should dedicate themselves to the goal of making a significant long term reduction in the number of fatal soaring accidents.

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 examine their flying skills, proficiency, and decision making skills to ensure every flight ends with a safe arrival at the intended point of landing.

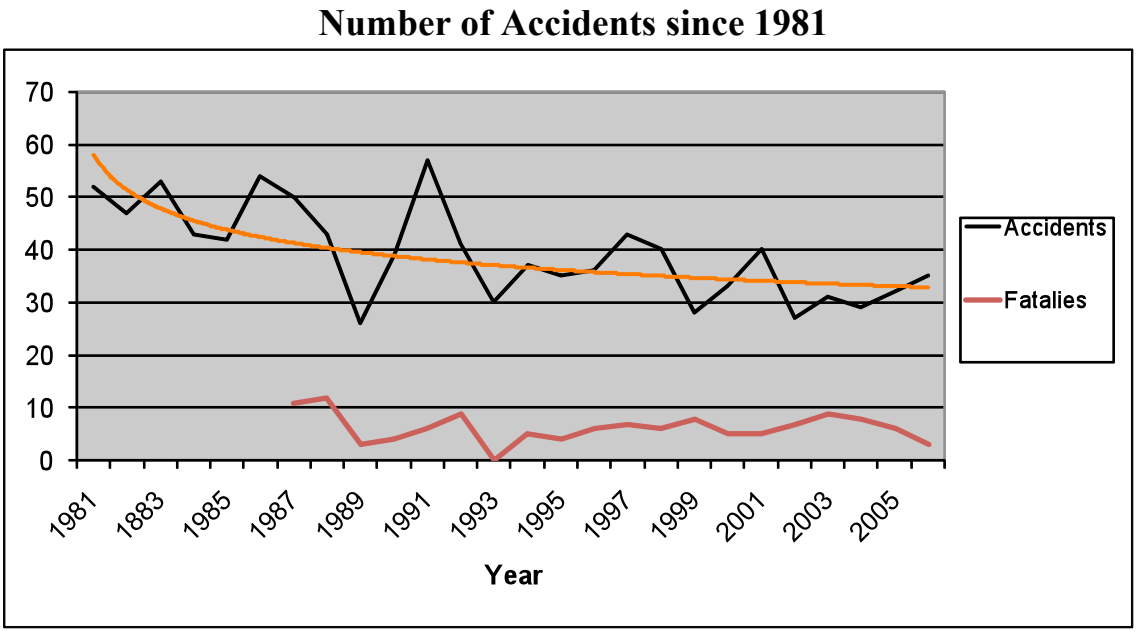


Figure 1 Number of total and fatal accidents on a per year basis.

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. The orange trend line clearly shows a plateau is being reached. As every instructor knows, plateaus are a normal

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

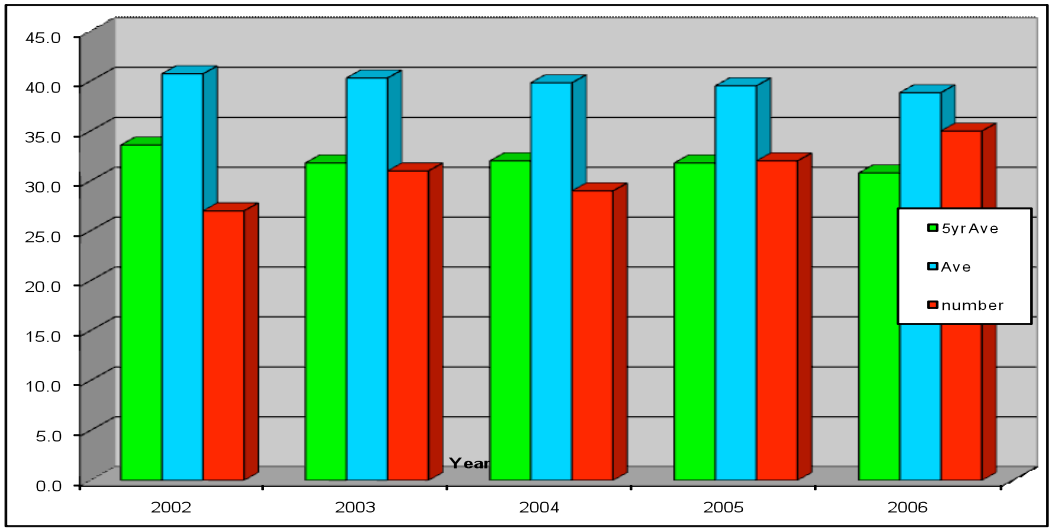
part of the learning process. The SSF trustees believe that the soaring community can overcome this problem and force another major reduction in the annual number of soaring accidents.

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 achieving the goal of making a significant long term reduction in the number of fatal soaring accidents.

FY06 ACCIDENT SUMMARY

NUMBER OF ACCIDENTS

For the twelve month period ending October 31, 2006, 36 gliders, motorgliders, towplanes, or airplanes were involved in accidents meeting the reporting requirements of Part 830 of the Code of Federal Regulations were reported to the National Transportation Safety Board. This represents a 9.5% increase in the number of accidents compared to the FY05 reporting period. The five-year average for the FY2002 – FY2006 reporting period is 30.8 accidents per year, representing a 3% decline in the five-year average from the FY05 reporting period.



Number of Soaring Accidents 2002 – 2006

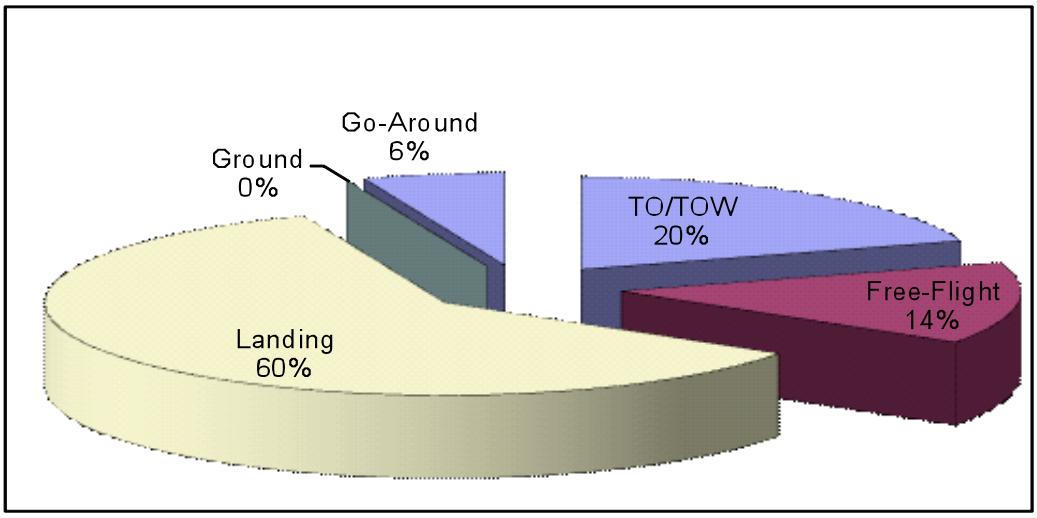
While the average number of accidents has shown a steady decline since 1981 (averaging 45.6/year in the 80's, 38.6/year in the 90's and 32.4/year so far this decade) the yearly number of accidents remains unacceptably high. In addition, the average number of fatalities has remained around 6 per year since the mid 1990's. In the FY06 reporting period 3 accidents resulted in fatal injuries to the pilot. In addition to these three fatalities, seven pilots received serious injuries while twenty-three pilots and eight passengers received minor or no injuries. Continuing a trend from the FY05 period, no tow plane pilots received fatal injuries in accidents involving accidents in those aircraft.

Of major concern is the mid-air collision between an ASG-29 glider and a corporate Hawker 800XP biz-jet. While the accident resulted in only minor injuries to 2 of the pilots and no injuries to the jet's co-pilot or passengers, both aircraft were substantially damaged in the collision. The

glider pilot bailed out while the jet made an emergency gear-up landing at the nearest airport. All pilots should exercise extra vigilance when operating in mixed traffic areas.

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 year, approach and landing accidents accounted for approximately 60% of the total number of accidents reported for the year. This percentage represents no change from the percentage recorded during the FY05 reporting period. Takeoff accidents account for 20% of the number of accidents, meaning that over 80% of the number of accidents occurred during the takeoff and landing phase of flight. A new category for this reporting period is Go-Around accidents in motorgliders. Two motorgliders crashed while attempting to abort the landing with the motor operating.



Percentage 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) was a major factor in three of the five glider takeoff accidents that occurred during the FY06 reporting period. In addition, two motorglider accidents occurred following a failure of the engine or propeller during the takeoff phase of flight. One assembly failure caused the wing to separate during the initial climb and one glider kited on take-off resulting in a fatal stall/spin accident.

The pilot of a Ventus 2C received serious injuries as the result of a hard landing. The pilot released after noticing an uncommanded opening of the spoilers. The glider suffered minor gear damage during the hard landing on the main grass runway. *NTSB DFW06CA111*.

The glider flight instructor and student both received serious injuries when their Grob 103A attempted to return to the runway from 100 feet AGL. The towplane pilot gave the glider pilot the "spoiler open" signal at 50 ft AGL. The glider pilot responded by moving to the left and the towplane pilot felt the tow terminate at 100 ft AGL. The glider stuck telephone lines while maneuvering to return to the runway. *NTSB LAX06TA234*.

The pilot of a Schweizer SGS1-26D received fatal injuries during a failed aerotow launch. The towplane and glider were approximately 40 feet AGL when the glider pitched up into a steep climb attitude. The rope broke as the glider climbed to about 150 ft AGL before stalling. The glider impacted the terrain in a nose down attitude. *NTSB LAX06LA158.*

The pilot of a Caproni A-21 received serious injuries after the right wing separated from the glider during the initial take-off run. The pilot had recently purchased the glider and this was the first flight after the glider was assembled. Examination of the wreckage revealed that the wing-to-fuselage locking mechanism was not fully engaged allowing the wing to separate in flight. *NTSB DFW06CA157.*

The glider flight instructor and student were uninjured when their Blanik L23 landed hard following a failed winch launch. The winch operator accelerated the glider faster than he desired so he momentarily reduced the winch's power. The glider stalled at 80 ft AGL and landed hard. *NTSB LAX06LA292*.

The pilot of a Scheibe SF-28A motorglider was fatally injured and the FAA inspector received minor injuries following a simulated engine failure. The FAA instructor was conducting a re-examination of the pilot following a previous motorglider accident. The inspector reported that at 400 ft AGL he simulated an engine failure by retarding the throttle to idle. The pilot stalled the glider while turning back toward the runway. The inspector reported that the pilot 'froze' on the controls which prevented attempts to recover from the stall. *NTSB NYC06FA205*.

The pilot of a Grob 109 motorglider was not injured following the in-flight separation of a propeller blade. The pilot successfully returned to the airport and landed without further incident. The motorglider was substantially damaged after the engine mounts separated from the firewall. *NTSB LAX07LA270*.

As the first 2 accidents indicate, a PT3 event may be the result of the pilot pulling the release at low altitude. The Soaring Safety Foundation has long stressed the importance of proper use of pre-takeoff checklists and the need to understand and use the proper in-flight emergency signals. Additionally, the SSF strongly encourages every pilot to develop and review an emergency plan prior to every takeoff. This plan should include actions the pilot will take at various altitudes in the event that an accidental or intentional release occurs.

The winch launch accident highlights the need to eliminate distractions during all launch operations. In addition, it should be noted that rapid and correct action on the part of the pilot is required to prevent low-altitude winch failures from becoming serious accidents. Pilots need

comprehensive training in winch operations with an emphasis on correct action following a launch failure.

Improper assembly of gliders is a constant hazard that we all face. Fortunately for this pilot quick action to release the tow-rope may have prevents this from becoming a fatal accident. Pilots are encouraged to seek assistance when assembling a newly purchased glider. It is also a good idea to have someone familiar with the assembly process to review the pilot's actions.

INFLIGHT ACCIDENTS

In the FY06 reporting period, four accidents were reported during the in-flight phase. These accidents occurred while the pilot was in free-flight, after release and before entering the landing pattern.

The pilot of an ASH-26E motorglider was seriously injured following the in-flight breakup of the aircraft. The pilot was conducting a X-C flight in wave conditions. The pilot was on an IFR flight plan and communicating with ATC when the glider inadvertently entered a cloud. The glider broke up and the pilot bailed out. *NTSB LAX06LA024*

The pilot of a HK 36 TTC 'Katana' motorglider was uninjured when the glider impacted terrain following a low altitude pass down the runway. The pilot reported that the engine failed to respond to the throttle during a low altitude pass. While attempting to perform a 180-degree turn, the left wing struck the ground and the glider impacted the terrain. *NTSB LAX06LA185.*

The pilot of an ASG-29 was involved in a mid-air collision with a Hawker 800XP Business-Jet at 16,000 ft MSL near Reno NV. The glider pilot and jet pilots all received minor injuries none of the 3 passengers were injured. The glider pilot was on a local familiarization flight in the glider, this was the 2nd flight of the day. While thermaling at 16,000 ft MSL the pilot noticed the jet seconds before impact. The jet flight crew were preparing their aircraft for landing and were just being handed off from Oakland center to Reno approach when the collision occurred. The glider pilot bailed out of the damaged glider while the jet made a gear up landing at Carson City airport. *NTSB LAX06FA277A and LAX06FA277B.*

The pilot of an experimental Windward OWL glider received minor injuries following the in-flight breakup of the aircraft. Both wings separated from the fuselage when the glider reached a recorded speed of 162 Kts, far above the 123 Kt Vne speed. The pilot was ejected from the glider and parachuted to safety. *NTSB DFW07LA006.*

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 on an IFR flight plan 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. Finally, pre-flight planning and proficiency in the specific glider are important tasks that can not be overlooked if safe flight is to be maintained.

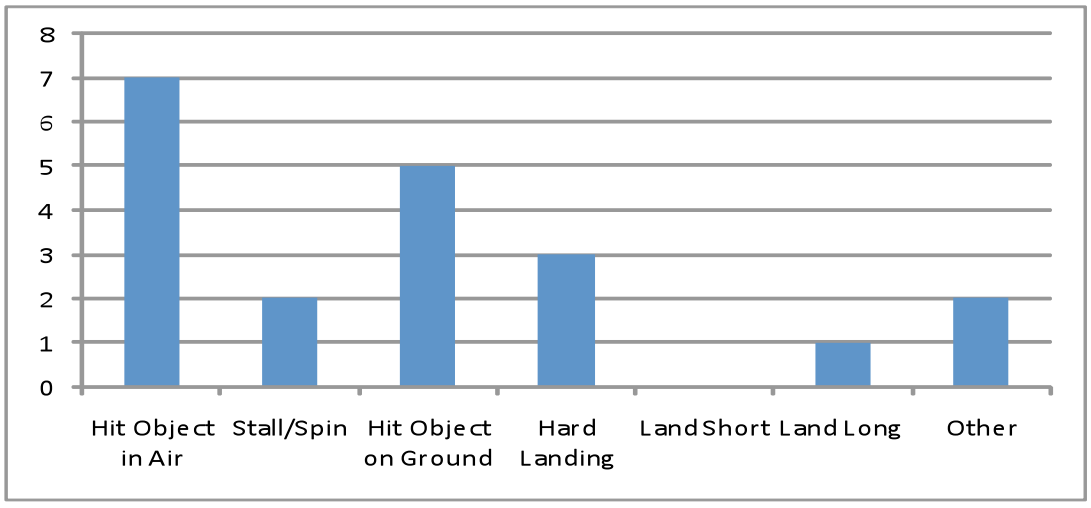
LANDING ACCIDENTS

Accidents occurring during the landing phase of flight again accounted for a majority of injuries to pilots and damaged or destroyed gliders. For the FY06 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 long, and hard landing accidents. Approximately 50% of these landing 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.

The pilot of a Blanik L-13 was uninjured, while the passenger received minor injuries while the pilot was attempting to make an on-airport landing. The pilot reported encountering 'strong sink' on base leg. He was unable to clear trees at the end of the runway, with the left wing striking a tree top. The glider fell short of the runway. *NTSB MIA06CA060*.

The pilot of a SZD 51-1 received minor injuries while making an on-airport landing. The commercially rated pilot was attempting to land on a 3638 foot long runway. The pilot reported encountering 'strong sink' on short final causing the glider to sink below glideslope and the left wing struck a tree. The glider 'cartwheeled' onto the runway coming to rest upright. A nearby weather reporting station indicated that there were gusty wind conditions during the time of the accident. *NTSB DFW06CA139.*

The pilot a SGS 1-35 was fatally injured after a stall/spin occurred while the glider was turning base to final. Witnesses reported seeing the glider approximately 800 ft AGL before the stall occurred. The glider impacted trees and a house about 1 mile south of the runway. *NTSB NYC06LA127.*



Accidents during the Approach and Landing Phase of Flight

The pilot of a LS-3 was seriously injured while attempting to land at his home airport. The pilot reported encountering 'strong sink' at 700 ft AGL. Not sure if he could make the runway, the pilot executed a 180-degree turn to land in a field. The glider rolled out at 30 ft AGL and stalled at 15 ft AGL. The glider landed hard on uneven terrain. *NTSB DEN06CA086***.**

The pilot of a PIK-20B was uninjured following an off-airport landing. The pilot executed an 'S-turn' with full flaps to compensate for being high on final. The 'faster than expected' altitude loss resulted in the glider striking a trees that bordered the intended landing field. *NTSB NYC06CA150*.

The pilot of a LS-3A was uninjured after landing long at an excessive speed. The pilot reported that he was high crossing the runway threshold and he lowered the nose instead of opening more spoilers to lose this height. The glider landed long and struck built up terrain on the left side of the runway run-out area. *NTSB SEA06CA143*.

The pilot of a Discus received serious injuries during an off-airport landing in tall corn. The pilot was maneuvering near a suitable off-airport landing area when he decided to check for lift under a cloud. The pilot was unable to find the lift and 'heavy-sinking air' made it impossible to return to the previous field. The pilot elected to land in an established corn field. The glider traveled about 40 feet into the corn before it dropped vertically 3 to 4 feet. *NTSB CHI06CA219*.

The pilot and passenger of a Blanik L-13 were uninjured following a ground loop on the runway. The pilot reported 'excessive sink' on downwind so he turned base leg early. The pilot then deployed more spoilers to compensate for the close in base leg. The glider touched down on the main gear and left wingtip with the nose about 20-degrees off the runway heading. The glider ground-looped and skidded to a stop. *NTSB CHI06CA252*.

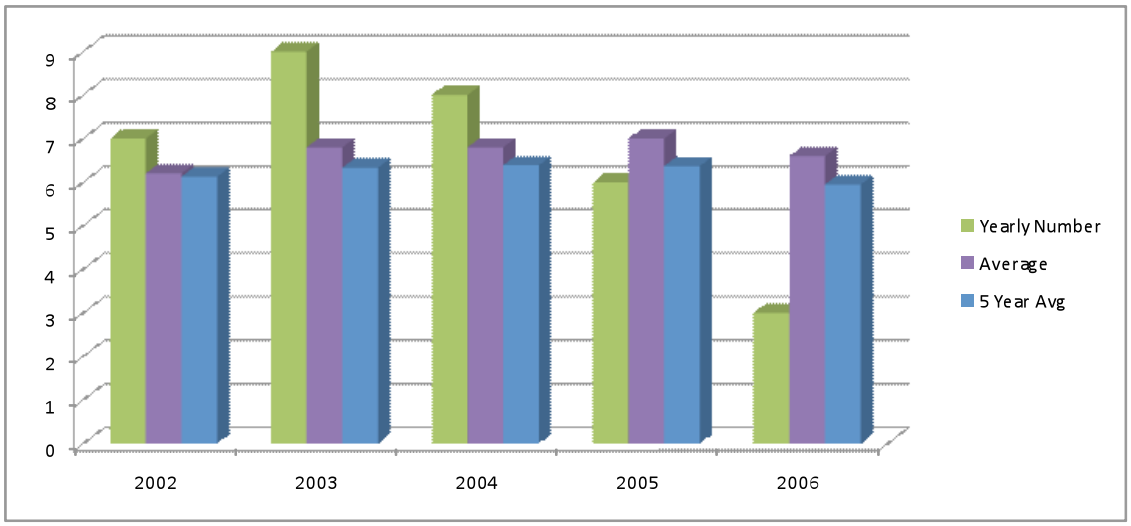
The remaining landing accidents include problems associated with stall/spin, hard landings, undershoots, and overshoots. Note also, that of the seven accidents listed above, six (6) of them occurred while the pilot was attempted to land on the home airport. Of the twenty-one gliders involved in landing accidents thirteen of them occurred while the pilot was attempting to land on an airport runway. Only 38.1% 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 decrease in wind speed with a decrease in altitude. When a gradient, or shear, is encountered the forces acting on the glider change and the glider responds to these 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

Three individuals were fatally injured participating in glider operations during the FY06 reporting period. This represents a significant decrease from the six fatalities reported for the previous year.



Summary of Fatalities
2002 – 2006

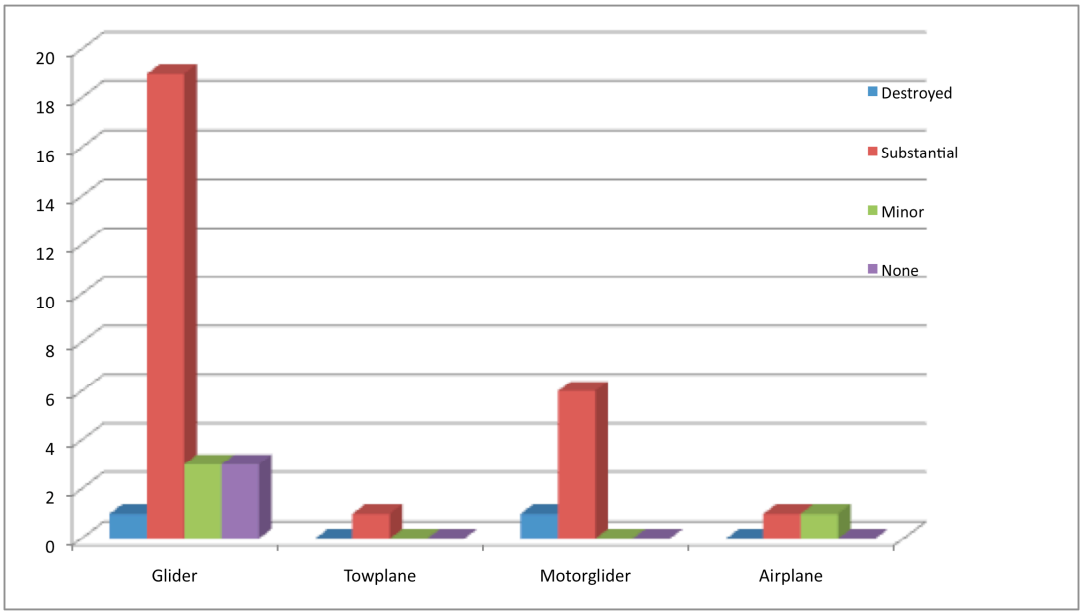
Two individuals fatally injured in accidents in 2006 were piloting a glider, the third pilot was operating a motorglider. Serious injuries to individuals participating in glider operations increased slightly from the previous reporting period. Minor injuries to individuals involved in accidents decreased significantly.

For the five-year period 2002 – 2006, 33 fatalities occurred. This equates to a five-year average of 6.6 fatalities per year a 6% reduction 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 relatively constant.

An analysis of the accident data in the FY06 reporting period shows that stalls and stall/spin events were a causal factor in **all** of the fatal accidents. Three private rated, and one FAA inspector pilots were involved in these fatal accidents. Every glider and tow plane pilot must evaluate their operation to help reduce the number of fatalities. Remember the old adage - aviate, navigate, communicate.

DAMAGE TO AIRCRAFT

One glider was reported destroyed and nineteen gliders received substantial damage as a result of accidents in the FY06 reporting period. One towplane and six motorgliders received substantial damage while one motorglider was reported as destroyed. In addition one airplane received substantial damage as the results of a mid-air collision with a glider.



Type of Aircraft Damage

AUXILIARY-POWERED SAILPLANES

For the twelve-month period ending October 31, 2006 seven accidents involving auxiliary powered sailplanes were reported to the National Transportation Safety Board. One pilot was fatally injured, one pilot, received serious injuries while the remaining 6 pilots received minor or no injuries. This represents a 350% increase in the number of accidents when compared to the previous reporting period, and a 100% increase in the number of fatalities. Most of these accidents are detailed in the above sections. However two go-around accidents occurred in FY06.

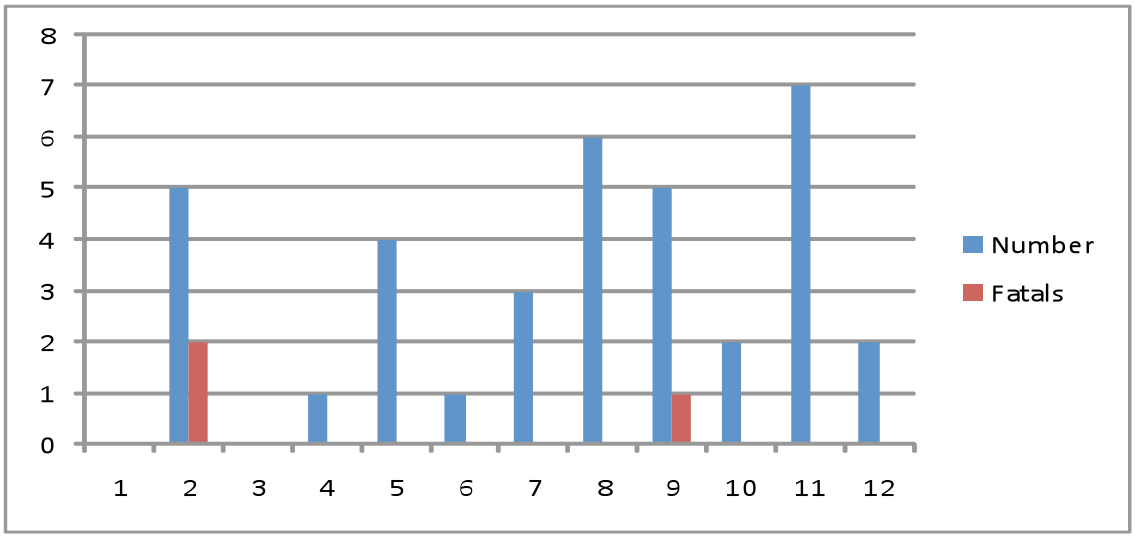
The flight instructor pilot of a HK 36 TTC motorglider and the private pilot were not injured while performing a go-around. The instructor was attempting to land the motorglider on a snow covered private airport. After rolling about 300 ft the pilot applied full power for a go-around. The pilot was planning to fly under power lines at the departure end of the runway when the left wing struck a tractor that was parked at the end of the runway. *NTSB SEA06CA023.*

The pilot of a UFM-10 motorglider was uninjured after striking trees along side the runway. The pilot reported bouncing the landing and elected to go-around for another attempt. The pilot added full power, but attempted too steep a climb, stalling one wing, and turning the glider toward the side of the runway. The glider failed to clear the trees resulting in substantial damage to the aircraft. *NTSB ATL06CA055.*

Motorgliders offer the pilot a chance to operate without a traditional ground crew. This places a larger burden on the pilot to ensure that the glider is properly prepared for flight and environmental factors will not create a take-off hazard. While self-launch capabilities free the pilot from relying on a towplane, launch failures still occur resulting in two accidents during the FY06 reporting period. Motorglider pilots should carefully evaluate the wind and weather conditions before beginning the take-off roll and determine a set of Emergency plans that could be accomplished if the glider isn't performing within expected parameters.

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

ACCIDENTS INVOLVING TOW AIRCRAFT

During FY06 only a single accident directly involved a towplane. As noted below, the towplane was preparing to launch when it was struck by a landing glider.

The pilot of a Piper Pawnee (PA-25-235) was uninjured when the airplane was struck by a landing Grob 103 glider. The glider pilot received minor injuries while the passenger was uninjured. *NTSB SEA06LA163A and SEA06LA163B.*

FLIGHT TRAINING AND SAFETY REPORT

As the FY06 statistics show, the majority of soaring accidents 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

[2] See Appendix A for more details

more altitude. In contrast closing the spoilers and increasing the airspeed are the only available 'tools' 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.

Takeoff accidents, though rare, are particularly frustrating because they usually avoidable. Both glider and launch vehicle are sitting on the ground before the launch begins. In FY06 two 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 Crew Resource Management (CRM) 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? 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 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? The SSF has created a web form that allows individuals and club, chapter, or commercial operators to provide the SSF with this essential information. To participate simply go to the SSF web site and click on the "Pilot Flight Time Form" icon, or follow this link http://www.soaringsafety.org/pilot-times.html. Enter as much information as you can. Tell your friends to do the same, and ask your club/chapter officer to enter your club data as well.

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.