SOARING SAFETY FOUNDATION

Nov 1, 2024 – Oct 31, 2025

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 database of glider/towplane accident information. This database is then used to develop accident prevention strategies and to continuously improve training methods to reduce the number of glider/tow-plane accidents.

The analysis information contained in this report represents data compiled by the SSF and reported in **Soaring** Magazine, at Flight Instructor Refresher Course, 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, promote, and conduct programs such as soaring safety seminars, flight instructor refresher courses, 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

For the twelve-month period ending October 31, 2025 seventeen (17) gliders, four (4) motor-gliders, and one (1) towplane were involved in twenty-two (22) separate accidents that met the reporting requirements of NTSB, 49 CFR 830.   This represents a 4.8% increase in the number of accidents reported during the previous 12 month reporting period. The five-year average for the FY21 – FY25 reporting period is 21 accidents per year, representing no change in the average number of accidents from the previous five-year period.

While the average number of accidents per year has shown a steady decline since 1981 (averaging 45.6/year in the 80's, 38.6/year in the 90's, 33.5/year in the 00's, 25.5/year for the 10's, and 21.2/year for this decade) the number of accidents each year remains too high.

The good news is that the average number of fatal accidents is starting to show a small decline over the past 5 years, decreasing from 5.9/year to 5.2/year in FY25. However, that is still considered too high and more needs to be done to reduce fatal accidents. In the FY25 reporting period, three (3) accidents resulted in fatal injuries to the pilots. In addition, four (4) pilots received serious injuries while seventeen (17) pilots and passengers received minor or no injuries in these nineteen (19) non-fatal accidents.

While the number of accidents reported to the NTSB is easy to track (Figure 1), and that number has been declining for both Gliders, and General Aviation as a whole, it is important that this number must be combined with flight hours or launches to determine the accident rate. Several years ago the SSF Trustees began asking all soaring organizations (clubs, chapters, commercial operators) to submit their flight times/launches in a confidential manner. This is done by mailing postcards to the organizations' representative listed in the SSA's database. For the past eight (8) years approximately 30% of the organizations have returned these postcards.

In January 2026, another mailing occurred, readers of this article are encouraged ask their organization to respond. Getting better data via soaring organizations confidentially reporting this data will help clarify this situation. In addition, the SSF began a real-time collection process capturing the number of participating gliders, the number of launches and flight time data using the Open Glider Network (OGN) system. A table showing year-to-date, and weekly data has been added to the our web site http://www.soaringsfety.org. Due to the lack of information regarding the number of gliders that report data into the OGN system and uncertain coverage areas, survey data is still needed to calibrate this OGN data.

A quick review of the fatal accidents show that the pilot of an ASH-24 glider was fatally injured after it stalled and spun in while attempting to land. The tow-pilot in a Pawnee was fatally injured after impacting terrain due to the glider kiting on take-off. The pilot of an ASW 27-18 (ASG-29) was fatally injured after the glider impacted the side of a mountain for unknown reasons. These fatal accidents are still under investigation by the NTSB.

As with previous years, the NTSB aviation accident database is missing data on four (4) of these twenty-two (22) accidents[1]. Details will be included in future reports and in FIRC presentations as that data is made available.

In FY25 eleven (11) landing accidents represented 50% of all accidents. Seven (7) out of eleven (11) or (64%) of the landing accidents occurred while the pilot was attempting to land at an airport, while the other four (4) or (36%) occurred while attempting an off-airport landings. Details of these accidents are given in the full report.

There were four (4) launch accidents in FY25, one (1) of them fatal, one (1) serious, and two (2) with no injuries. There were two (2) cruise flight accidents in FY25. Details on these accidents will be given in the full report.

There were four (4) motor-gliders involved in accidents during the FY25 reporting period. See the full report for more details.

While the number of accidents has remained constant, it remains to be seen if how number of hours flown or launches made has changed. Please respond to the SSF and/or FAA survey for 2025 to get us the data we need to understand this change.

The Soaring Safety Foundation also encourages each and every individual to be constantly aware of and manage their own personal risk factors as they fly gliders and towplanes. This includes setting your own personal minimums for weather, thernalling decision height, and other factors that impact your safety. Using the IMSAFE checklist and maintaining our flying proficiency not just your flying currency are other factors that impact your personal safety. We highly encourage the use of the FAA WINGS program when complying with the FAR 61.56 Flight Review requirement.

We must collectively continue to monitor the safety culture that exists in the club or commercial operation we fly at, remembering that WE are the safety culture. Please adopt the mantra "If you SEE something, SAY something" to your clubs BOD, Safety Officer or Owner. Having a Safety Culture that works means that every individual needs to participate. Lets strive for fewer accidents and zero fatalities in 2026!

The Soaring Safety Foundation continues to provide tools for your location to enhance safety. We offer a confidential Site Survey that gives your operation an objective look at how you are doing. We also offer Safety Seminars at your location as a part of our ongoing commitment to safety. Our Flight Instructor Refresher Courses (FIRC) allow

[1]Updated information as of 03/212025 may differ from numbers pointed in the April issue of SOARING.

ANY certificated Flight Instructor to reset the Recency of Experience end date on their certificate in a highly interactive in-person format. In addition, CFI's can now use the FIRC to reinstate their certificate, provided their instructor privileges have expired within the preceding 3 calendar months. More information on these and our growing collection of on-line safety and training programs can be found on our website (www.soaringsafety.org).

TABLE OF CONTENTS

SOARING SAFETY FOUNDATION

ANNUAL SAFETY REPORT

FY 2025

This report covers the FY25 (November 1, 2024 to October 31, 2025) reporting period. A review of the NTSB accident database shows a 4.8% increase (22 vs 21) in the number of US soaring accidents during this time period compared to the FY24 reporting period. The number of fatal accidents in FY25 also increased 50% going from two (2) to three (3). While the number of accidents reported to the NTSB increased slightly, 2025 saw a 6% decrease in the number of insurance claims compared to 2024. This decrease will result in no general increase in premiums for 2026.

While the long-term trend in accidents reported to the NTSB continues to decline, there is general agreement that more steps must be taken to continue reducing the number of accidents and to eliminate all fatal accidents.

Number of Accidents since 1987

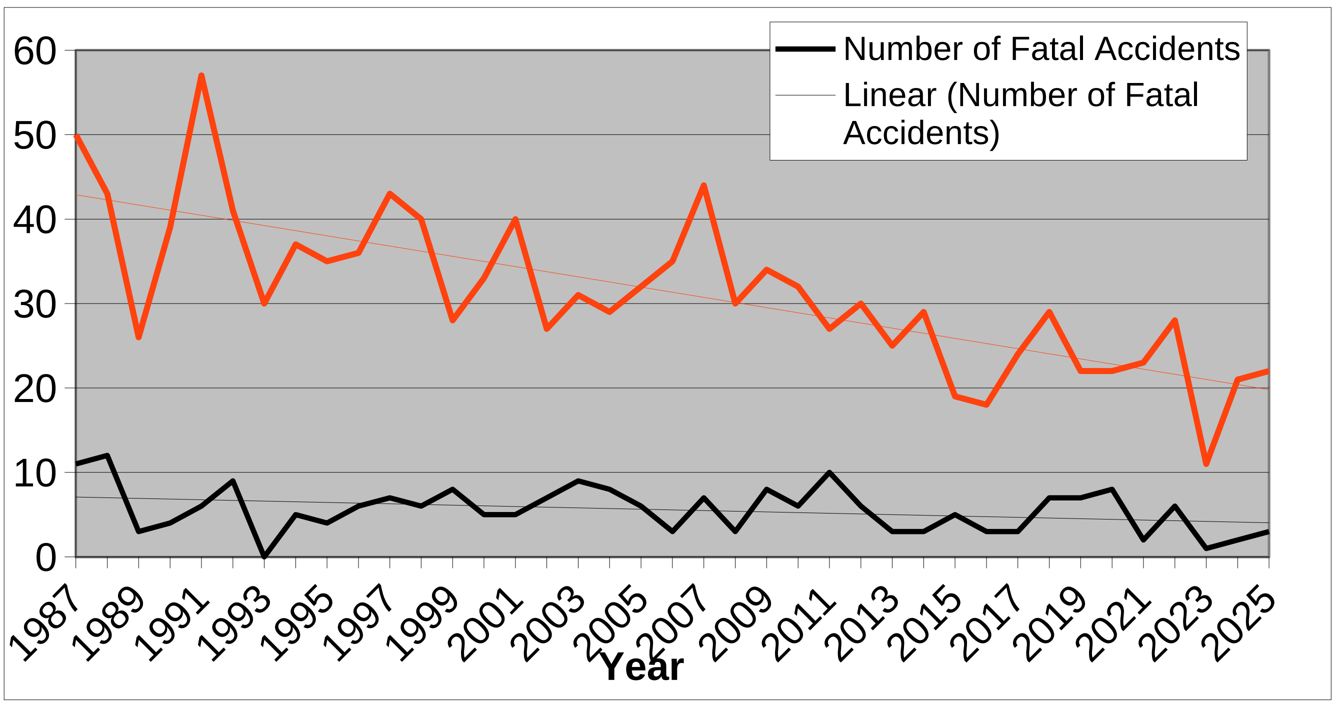

Figure 1 Total number of accidents and fatal accidents on a per year basis.

Figure 1 shows the total number of accidents and the number of fatal accidents from 1987 to the present. The top line is the total number of accidents each year, while the lower line is the number of fatal accidents. An analysis of this data shows two trends. One is the total number of accidents is declining and has been trending down since the SSF began recording this data. The rate of decline is not as rapid as we would like, but the long-term trend is in the right direction. The other is fatal accidents are showing a slight decline averaging just under 5.2 fatal accidents per year in FY25. See the **Fatal Accidents** section for more details on this topic.

For many reasons[2], this report represents an incomplete view of the accidents involving US glider pilots. Despite these limitations, this annual report is published to highlight glider/towplane accidents listed in the NTSB aviation accident database. Examination of these accidents can help point out trends and issues that need to be resolved. Safety is everyone's business, every pilot must continuously evaluate their flying skills, proficiency, and decision making skills to ensure every flight begins with a safe departure and ends with a safe arrival at the intended point of landing.

Another important point to make is that figure 1 shows the number of accidents, it does not show the accident statistics. To make a statistically significant figure the SSF would need to know the number of flights, or the number of hours flown in the US. While this information has been hard to collect at the national level, it is believed that every club and commercial operation has this information (at least they know the number of launches they do). See the **SSF Trustee Action: Glider Flight Data** section for more details.

For the past 8 years the SSF mailed postcards and letters to the individual every club, chapter, and commercial operator in the U.S. listed as the organizations SSA point of contact. In each of these years approximately 33% of these clubs, chapters, and commercial operators anonymously responded with this flight time data. In January of 2026 the SSF again sent requests to every club, chapter, and commercial operator in the US. The **SSF Trustee Action: Glider Flight Data** section contains the results from 2018-2025 data. Given no change in the number of accidents in FY25, it is important to understand what changes, if any, occurred in flight operations. The SSF Trustees encourage everyone to contact their club/chapter/commercial operator leadership to verify that they are responding to this important confidential request. SSA clubs and chapters should regularly update with the SSA their soaring site contact information so the SSF can collect more data.

This trend, where the total number of accidents is declining while the number of fatal accidents remain fairly constant does NOT appear in the General Aviation accident numbers. As figures 2 and 3 show, GA percentage of fatal to non-fatal accidents has been slowly decreasing to about 17% per year, while Glider fatal to non-fatal percentages have varied from about 10% to almost 40% over the last 20 years.

As shown below, the largest number of accidents continues to occur in the landing phase of flight. However, when looking at the percentage of fatal vs non-fatal accidents in each phase of flight we see a shift from the cruise phase of flight to the launch phase of flight. This means that different programs are needed to address the different causes of these accidents. Landing accidents are primarily due to the pilots coming in low and striking an object short of the runway. Fatal accidents are primarily due to pilots losing control of the glider while maneuvering close to the terrain. This may be an impulsive response to a launch abort or attempting to scratch out to avoid an off-airport landing. In either case, this maneuvering leads to a stall/spin without enough altitude to recover. This issue is discussed in more detail in the **Fatal Accidents** section.

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

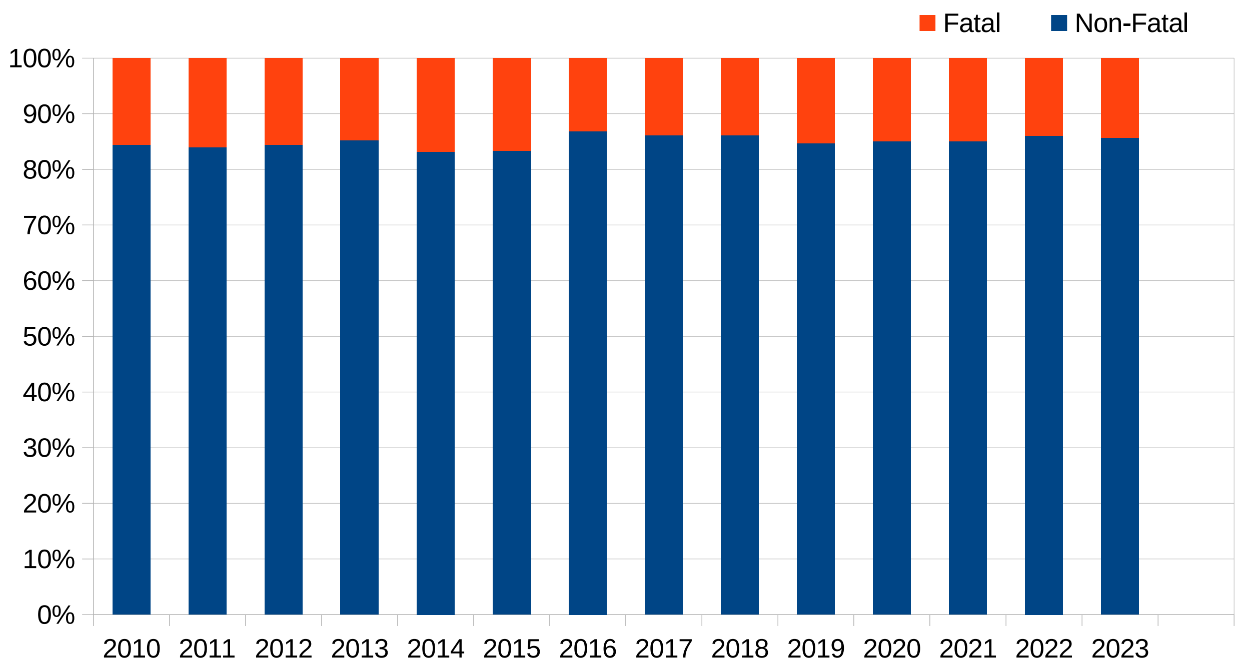

Figure 2: Percentage of fatal to non-fatal accidents in GA

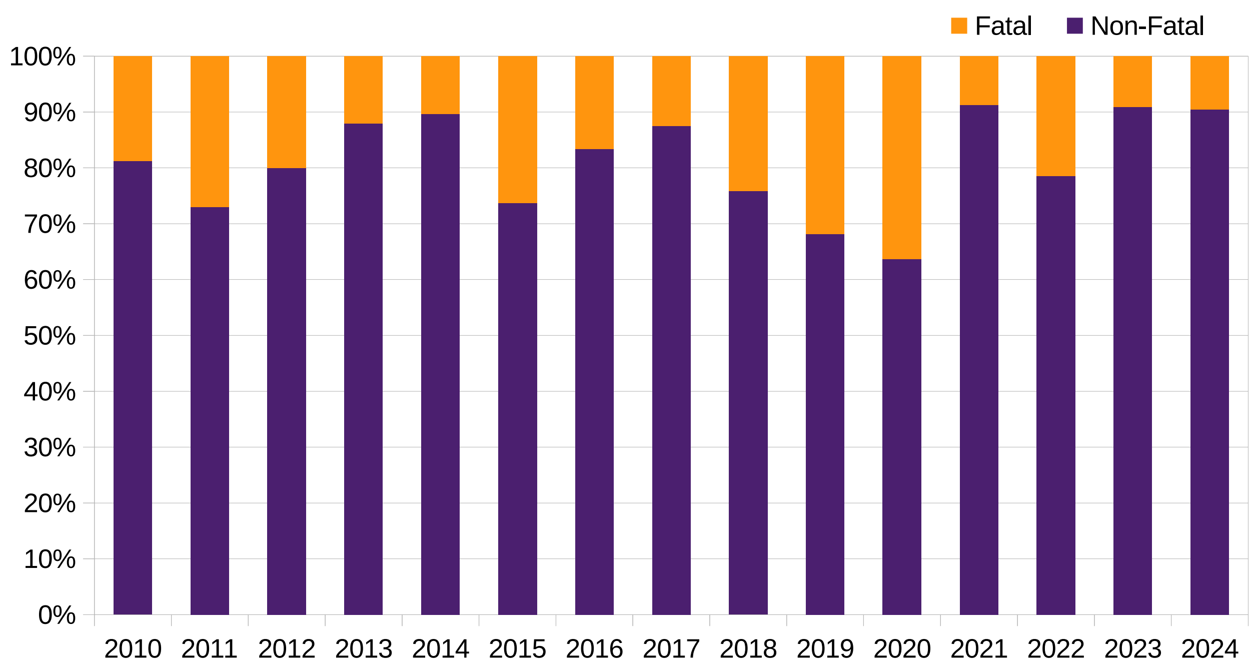

Figure 3: Percentage of fatal to non-fatal accidents in Gliding

To continue reducing all accidents and to eliminate all fatal accidents, ALL glider pilots must realize that this is not a problem with individual pilots. The majority of accidents are typically not caused by pilots ignoring the rules or taking incredible risks. Instead, we must recognize that pilots are responding to situations in the manner in which they were trained. These Human-Factors errors are symptoms of a deeper systemic problem with our training environment and club/commercial operator safety cultures. In other words, this is a cultural problem within the soaring community.

For the past few years, the SSF has been promoting the use of Scenario Based Training (SBT) as a viable method for establishing and maintaining a strong safety culture. The use of SBT in primary training establishes a habit pattern that new pilots will adopt and use throughout their aviation career. The use of SBT with rated pilots during flight reviews and spring check-outs will help them understand how risks are evaluated and mitigated. The more flight instructors use SBT the better we will all be in the soaring community. Using SBT, you can help change the safety culture of your club or commercial operation, and help the SSA membership reach its goal of zero fatal accidents each year. For more details see the **SSF Recommendation: Scenario Based Training** section later in this report.

In December 2023 the SSF was introduced to the concept of Safety-II to expand on the concepts found in the currently implemented Safety-I programs. For more information see the **SSF Trustee Action: Safety-II concept** section later in this report.

FY25 ACCIDENT SUMMARY

Number of Accidents

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While the average number of accidents per year has shown a steady decline since 1981 (averaging 45.6/year in the 80’s, 38.6/year in the 90’s, 33.5/year in the 00’s, 25.5/year for the 10’s, and 21.2/year for this decade) the number of accidents each year remains too high.

The good news is that the average number of fatal accidents is starting to show a small decline over the past 5 years, decreasing from 5.9/year to 5.2/year in FY25. However, that is still considered too high and more needs to be done to reduce fatal accidents. In the FY25 reporting period, three (3) accidents resulted in fatal injuries to the pilots. In addition, four (4) pilots received serious injuries while seventeen (17) pilots and passengers received minor or no injuries in these eighteen (18) non-fatal accidents.

Figure 4 shows the number of accidents that occurred in each year (green bar), the 5-year moving average that covers the noted year and the 4 previous years (red bar), and the long term average from 1981 to the listed year (yellow bar).

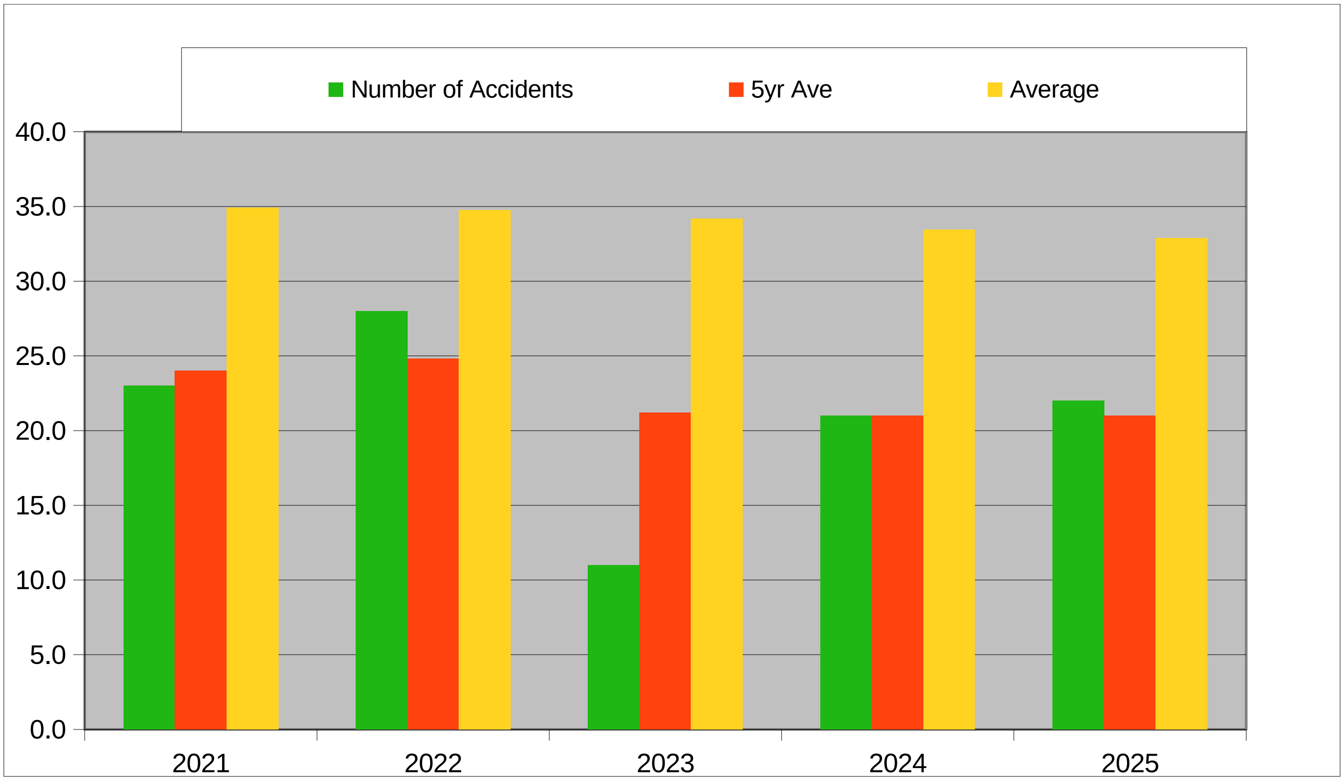

Figure 4 Number of accident, 5 year average FY21 - FY25

Phase of Flight

The Soaring Safety Foundation separates accidents into 4 major phases of flight. Launch (PTL), Cruise (Free-flight – FF), Landing (Lnd), and Unknown (Unk). Accidents are unknown if the NTSB has not published a preliminary or final report describing the accident of if there are no witnesses to a fatal accident. Figure 5 is a graphical representation of this accident breakdown while Table 1 is a textual version.

The number of accidents that occur during the approach and landing phase of flight again surpasses those recorded during any other phase of flight. For the FY25 reporting period, approach and landing accidents were 50% of the total number of accidents reported for the year[3]. Continuing the historical trend, one-third (36% or 4/11) of the landing accidents occurred when the pilots attempted an off-airport landing while the remaining accidents (64% or 7/11) occurred while landing at an airport. Historically landing accidents contribute to the largest number of accidents year in and year out.

There were four (4) failed launch accidents in this reporting period, one (1) of them resulted in fatal injuries to the pilot. One (1) pilot was seriously injured, while the remaining two (2) pilots received no

[3]This is the percentage of the accidents that the NTSB has completed investigating and has released a probably cause.

injuries. The NTSB data show that 9.1% of the accidents occurred while the glider was in cruise flight and 22.7% for unknown reasons.

It should come as no surprise a majority of accidents occur during the takeoff and landing phase of flight, where the tolerance for error is greatly diminished and opportunities for pilots to overcome errors in judgment or the use of poor decision-making skills become increasingly difficult. Pilots must become proficient in dealing with launch emergencies. Having a pre-planned set of actions that pilots will execute if the launch starts to go wrong. Pilots must conduct a proper pre-launch written checklist and use a pre-launch briefing to mentally prepare for contingencies. However, accident rates show that just having a plan does not guarantee a successful outcome. Current training for failed launches may be leading pilots to make an impulsive response to return to the runway. See the **SSF Recommendation: Planning for Practice PTL Events** for more details on this topic.

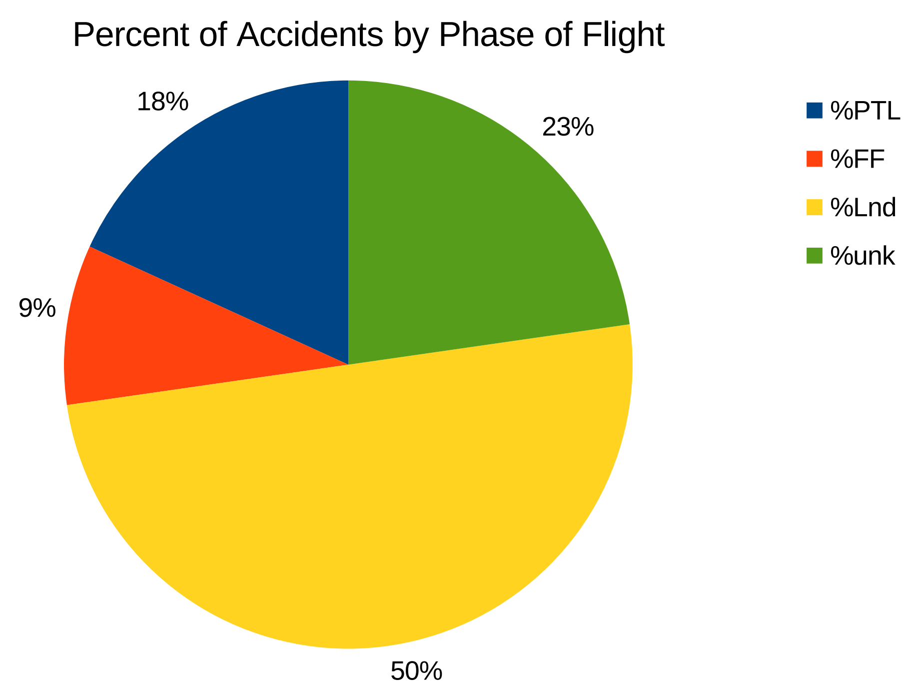

Figure 5: Glider accidents by Phase of Flight in FY25

Take-off scenarios can help students and pilots mentally walk through numerous potential launch failures. What would you do if the launch failed while the glider was still on the ground, just lifting off, somewhere above 500 ft, or just prior to release? What would you do if the towplane pilot fanned the rudder during tow (c*heck your spoilers*)? How would a cross-wind affect the towplane and glider (*weather-vane on the ground, drift downwind in the air*), or what would you do in the self-launching glider whose engine just sputtered (*pitch to a best glide speed attitude*)? Can you explain to your instructor why these answers are correct? How can you and your instructor develop a realistic scenario to safely practice these potentially hazardous events (*use Condor*)? NTSB accident reports are also an excellent resource for creating these scenarios. Remember, the better the learning the more the pilot will get out of the training. See the **SSF Recommendation: Planning for Practice PTL Events** section for more details on how to deal with launch failures.

As shown in figure 6, the largest number of soaring accidents occurs during the landing phase of flight. However, Figure 7 shows an entirely different picture when comparing fatal to non-fatal accidents in each phase of flight. To clarify this, the blue (launch fatalities) in the 2020-2025 section of the graph show that 10 of the 28 launch accidents (36%) are fatal while the yellow bar (landing fatalities) is 8.5% (5 of 71).

It may surprise SSA members to learn this analysis shows that up until FY20 a larger percentage of accidents during the cruise phase of flight result in fatal injuries to pilots than during the other categories. Starting in FY21 there have been no fatal cruise flight accidents. The data now shows the launch phase of flight now has the highest percentage of accidents resulting in fatal injuries to the pilot.

Table 1 shows the number of fatal and non-fatal accidents for the fiscal years 2020 – 2025. The suffix notation "-F" (fatal) and "-NF" (nonfatal) is attached to each of the 3 major phases of flight Launch (PTL), Cruise (Free Flight - FF), Landing (Lnd), and Unknown (Unk). Accidents during ground handling are not broken out, but are included in the totals. Table 1 shows the same information as is found graphically in Figures 6 and 7. Note that looking at the percentage of fatal to non-fatal accidents in each phase of flight during this 6-year period 19% of the cruise flight accidents result in fatal injuries to pilots or passengers compared to 36% during the launch phase and just 8% during the landing phase of flight.

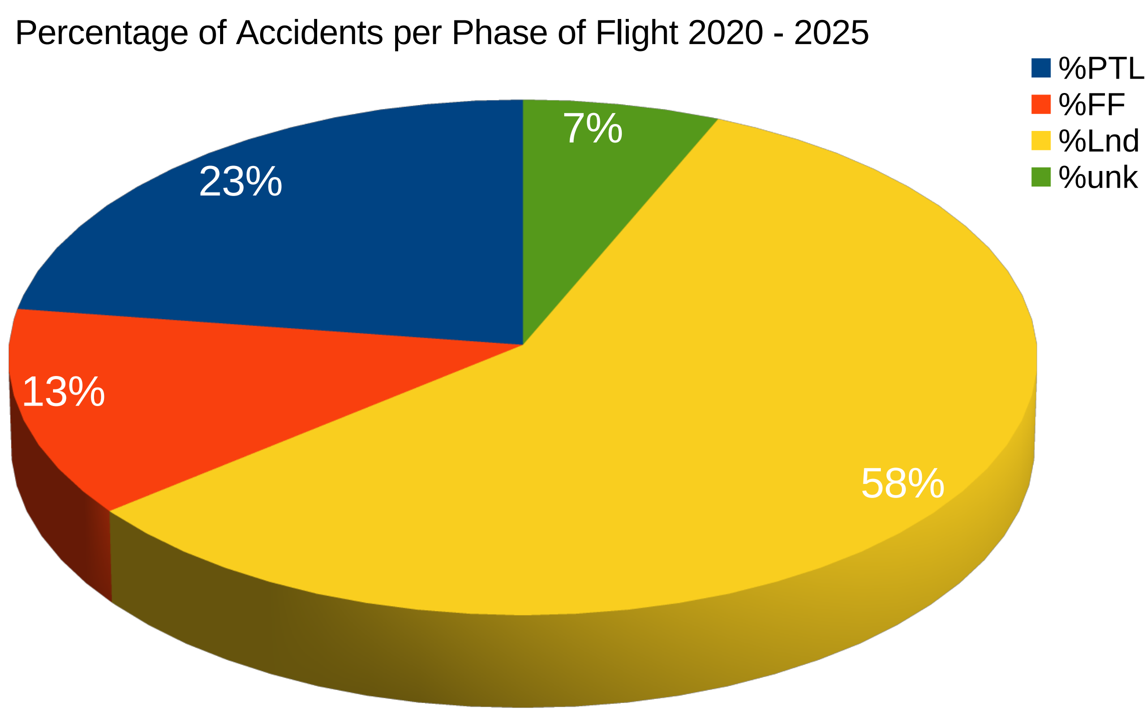

Figure 6: Percentage of Accidents by Phase of Flight

Pilots need to recognize the risks of low altitude maneuvering. Circling at low speeds in turbulent air close to the ground can easily lead to an unintentional stall or spin entry in many gliders. Recovery, even for a proficient pilot can be impossible. Pilots must also learn how to deal with problems and emergencies in the launch and landing phases of flight. Immediately entering a steep right turn following a PTL event can easily lead to a stall/spin crash. The SSF Goal Oriented Approach, described below, provides guidance on how to plan and execute safe landings.

	PTL-NF	PTL-F	FF-NF	FF-F	Lnd-NF	Lnd-F	Unk-NF	Unk-F	Total
2020	3	4	1	3	9	1	1	0	22
2021	5	2	1	0	15	0	0	0	23
2022	4	1	2	0	13	4	0	1	28
2023	0	0	4	0	5	0	0	1	11
2024	3	2	3	0	13	0	0	0	21
2025	3	1	2	0	10	1	4	1	22
Total	18	10	13	3	65	6	5	3	127

Table 1: Number of non-fatal (NF) and fatal (F) accidents from 2020- 2025

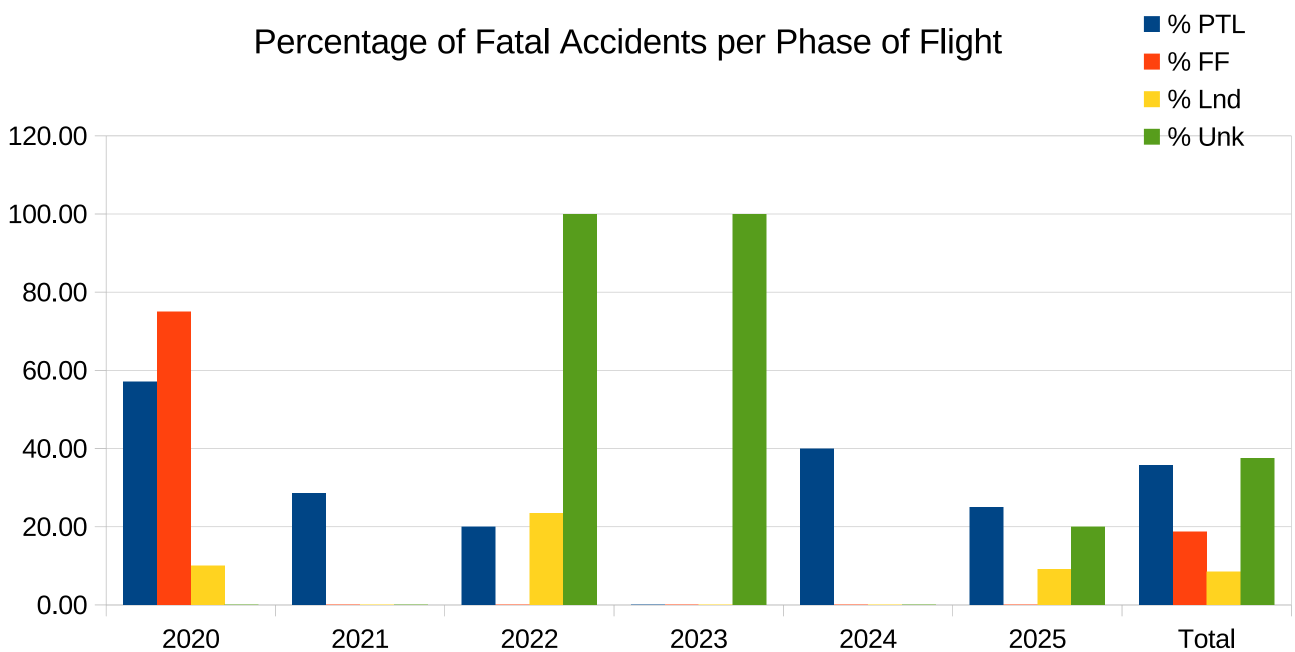

Figure 7: Percentage of Fatal Accidents by Phase of Flight

Launch Accidents

There were four (4) launch accidents in the FY25 reporting period. Pilots must mentally prepare for a failed launch by developing a specific set of action plans to deal with several contingencies. The task is then to execute the proper plan at the proper time. Flight instructors should continue to emphasize launch emergencies during flight reviews, club check rides and initial flight training. See the **Planning for Practice PTL Events** below for more details.
Soaring operations (clubs and commercial operators) should evaluate their training syllabus to ensure that this training is provided to both students and rated pilots. It should also be noted that just 'pulling the release' to simulate a rope break is not sufficient. Over the past few decades accident reports indicate that over 60% of PTL accidents occur after the pilot intentionally pulled the release. Being prepared can help pilots better deal with these types of unexpected events. Instructors must evaluate and critique the pilot's decision making skills in addition to the in-flight piloting skills.

Aerotow Launch Accidents

There were four (4) aerotow launch PTL accidents reported in the FY25 reporting period.

The private rated pilot of a LS-6B was not injured while the glider was substantially damaged during a failed aerotow launch. The pilot reported that he began the launch without a wing runner. A few seconds after the take-off began the left wing contacted the ground. The pilot pulled the release, but was unable to prevent the glider from cartwheeling. *NTSB CEN25LA177*

The ATP rated pilot of a Pegasus was seriously injured while the glider was substantially damaged during a failed aerotow launch. The pilot reported that he was distracted during the preflight assembly process and failed to connect the elevator push-rod to the elevator flight control. Once the glider became airborne, the pilot realized that there was no elevator control and he released immediately. The glider nosed down and impacted terrain. *NTSB ERA25LA303*

The private rated pilot of a Grob 102 was not injured while the glider was substantially damaged during a failed aerotow launch. The pilot reported that initially the glider began drifting left due to a crosswind. As the tow progressed, the glider's left wing contacted the ground and began to ground loop so the pilot pulled the released. The right wing then struck a parked golf cart before the glider came to a stop. *NTSB CEN25LA340*

The fatal aerotow launch accident is described below in the **Fatal Accidents** section.

Ground Launch Accidents

There were no ground launch PTL accident reported in the FY25 reporting period.

Self-Launch Accidents

There were no self-launch PTL accidents reported in the FY25 reporting period.

When practicing emergency procedures pilots must consider all factors such as wind, terrain, density altitude, glider and towplane performance. An exact plan of action must include how the towplane will maneuver, stay on the extended runway centerline or drift downwind after clearing obstacles to give the glider pilot a more direct turn into the wind. While altitude is important, the lateral position is also important as a low climb rate or terrain features may place the glider in a position where a safe return to the runway is not possible.

It is also essential that the glider has sufficient airspeed to safely maneuver for the intended landing. The pitch attitude of a launching glider (regardless of launch method) is not the pitch attitude that must be achieved once off tow, or when the engine has quit. The immediate pilot action must be to establish the proper nose low pitch attitude and then wait several seconds to ensure that the proper airspeed has been obtained. Only then can any turn safely be made. Pilots who impulsively make an immediate turn without ensuring the proper pitch attitude and airspeed are at high risk of a stall/spin accident.

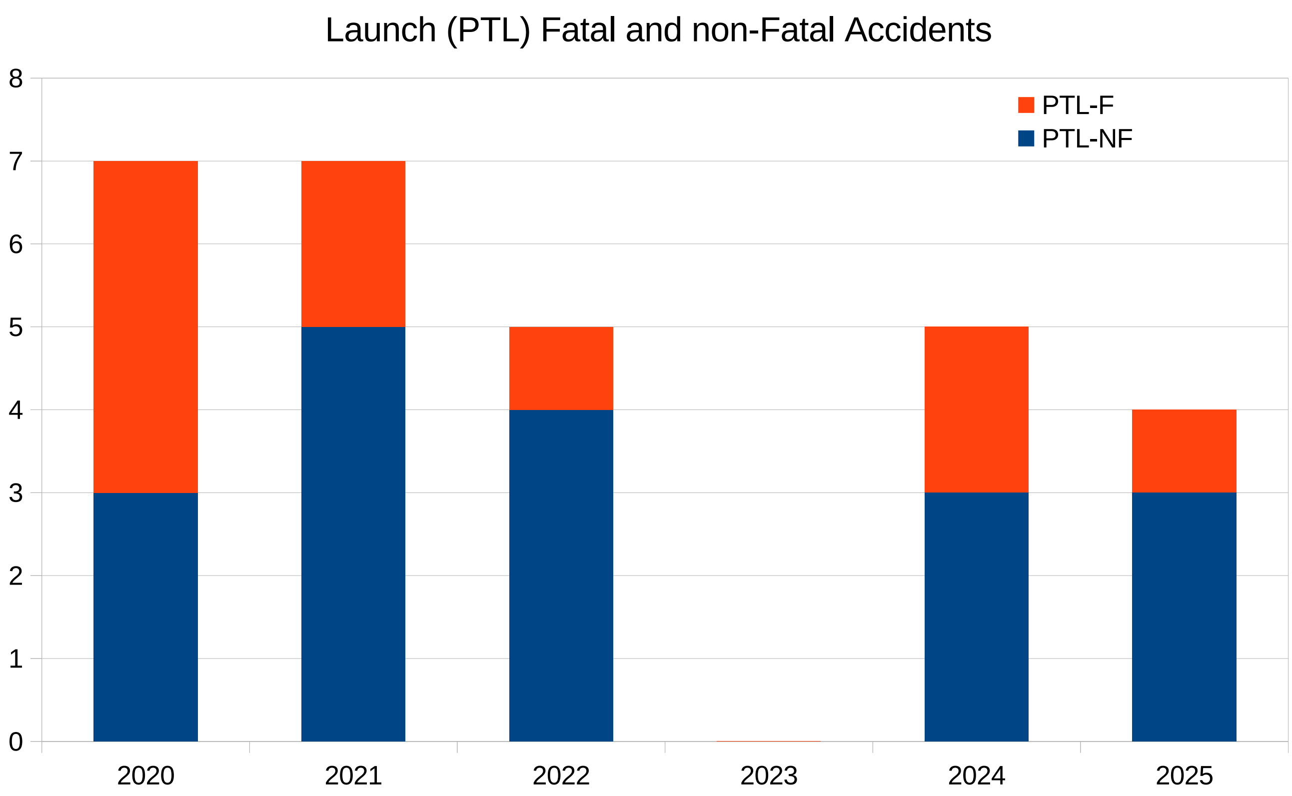

Figure 8: Number of fatal and non-fatal launch accidents

It is also desirable to perform any turns with as much altitude as possible. This may be accomplished by having the towplane drift downwind from the runway centerline or the pilot can make their initial turn away from the extended runway centerline to give the glider turning room so a final turn will allow the glider to roll out on the extended runway centerline avoiding a final alignment turn much closer to the ground. Finally, the pilot must be prepared to change plans and make a safe off-airport landing if it becomes clear that making the runway is no longer an option.

Once a decision to abort the launch is made and a decision to turn back toward the field is made, the most important task to concentrate on is the **quality** of the turn, pitch attitude and proper coordination.

MAINTAIN THE PROPER PITCH ATTITUDE (AIRSPEED) AND MAKE A COORDINATED TURN!

Using SBT techniques, pilots can be taught to deal with these situations. Pilots and instructors can practice these scenarios at a safe altitude and with the full knowledge and involvement of the tow pilot. Using a guided discussion format the instructor can ensure the pilot recognizes all the internal and external factors that must be accounted for. The pilot and instructor must next develop an initial plan to safely practice this maneuver. With this initial plan in place, the pilot and instructor must then talk with the tow pilot to get agreement between all 3 pilots that the plan can be safely executed. The final step is to fly this flight. The instructor can now evaluate the glider pilots flight skills and his/her decision making skills.

All tow operations need to have a Standard Operation Procedure for tow. This SOP should define the normal tow procedures and set the expectations for both the glider and towplane pilots. Any deviation from these SOPs needs to be communicated between both pilots before the launch begins. Abnormal operations like holding the towplane in ground effect before zoom climbing at the end of the runway need to be completely discussed before the launch begins. Failure to do so leaves the glider pilot in a difficult situation not knowing if the towplane is having a performance problem or if both aircraft will clear any obstacles off the end of the runway.

Finally, but most importantly, it is critical for pilots to understand that a pilot’s most basic responsibility is control of the aircraft. Loss of Control is the leading cause of fatal Glider and General Aviation accidents in the US. Remember, regardless of the circumstances, **FLY THE AIRCRAFT!!**

Cruise Flight Accidents

There were two (2) non-fatal cruise flight accidents reported during the FY25 reporting period. Figure 9 shows the total number of cruise flight accidents from FY20 to FY25.

The pilot of a Carat A was seriously injured while the motor-glider was substantially damaged after coming to rest inverted following a loss of power while in cruise flight. The pilot reported what after about 1 hour of powered flight the engine experienced a partial power loss and began to run rough. The engine then quit and attempts to restart it were unsuccessful. The pilot then performed a forced landing at a nearby airport, landing hard and coming to rest inverted. *NTSB ERA25LA064*

The commercial pilot in a Stemme S10-VT was not injured while the motor-glider was substantially damaged after impacting a fence after the engine lost power in cruise flight. The pilot reported that while enroute to his destination the engine lost power and attempts to restart it failed. The glider impacted a fence and came to rest upright on a dirt road during the forced landing. The pilot noted that the engine failed because he ran out of fuel. NTSB CEN25LA129

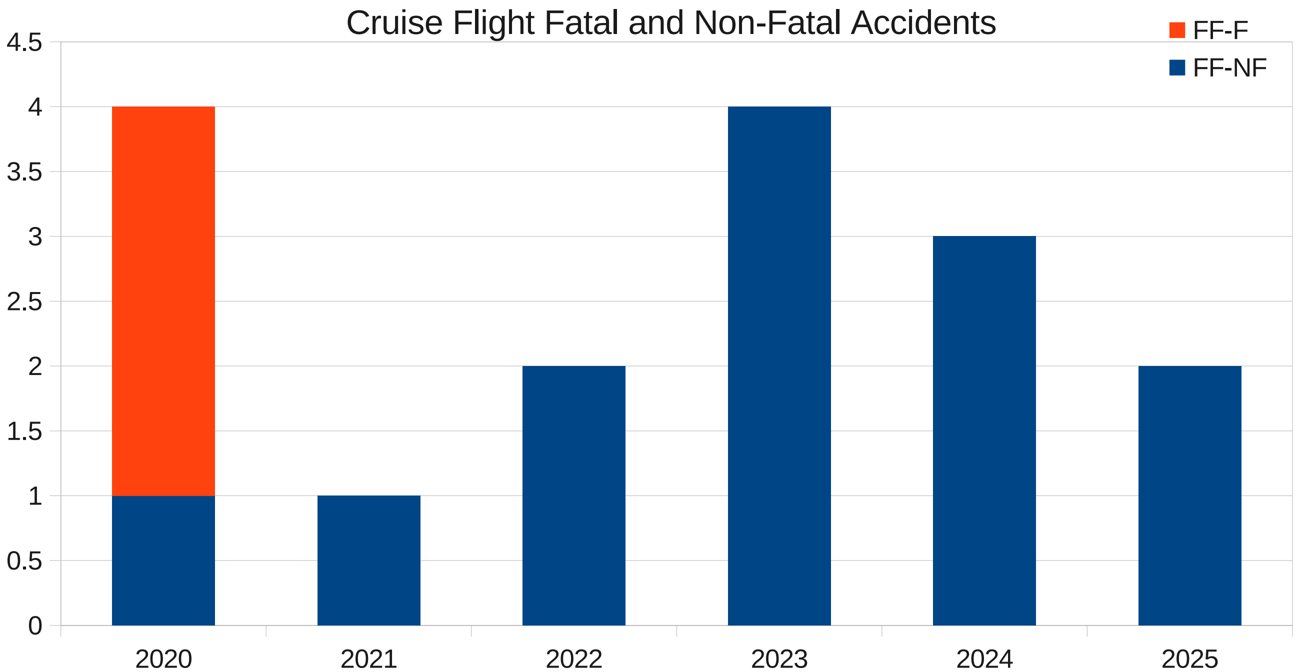

Figure 9: Number of Fatal and non-Fatal Cruise Flight Accidents

Towplane Accident

There was one (1) fatal towplane accident reported in the FY25 reporting period. This is reported in the **Fatal Accidents** section of this report.

Landing Accidents

Accidents occurring during the landing phase of flight again accounted for the majority of injuries to pilots and damaged or destroyed gliders. During the FY25 reporting period, gliders hitting objects on final or during the landing roll accounted for the majority of the landing accidents. Continuing a historical trend, two-thirds of the landing accidents (64%) occurred while the pilot was landing at an airport. The remaining 36% accidents occurred while the pilot was making an off-airport landing.

Figure 10 shows the total number of landing accidents from FY20 to FY25 broken down by fatal and non-fatal accidents. This figure shows that the majority of landing accidents do not result in fatal injuries to the pilot. A deeper analysis of the landing accidents in FY25 indicate pilots continue to strike objects while on the ground roll (2 accidents) or hit an object on final (2 accidents). See figure 11 for a complete breakdown of landing accident factors.

During the FY25 reporting period ten (10) non-fatal and one (1) fatal landing accidents met the reporting requirements of NTSB part 830. The NTSB reports indicate that two (2) student, four (4) private, two (2) commercial, one (1) ATP, and one (1) CFI pilots were involved in these accidents.

The commercial pilot in a ASW 24 was seriously injured while the glider was substantially damaged while making an off-airport landing. The pilot reported that he released from tow about 2,500 ft AGL and 3 miles downwind from the airport. Using weak lift the pilot managed to climb eventually returning to 2.300 ft AGL while drifting a further 5 miles downwind. While heading back to the airport and at 1,000 ft AGL and still 3 miles from the airport the pilot picked an pasture and configured the glider for landing. On final and approaching a fence, the pilot retracted the spoilers and pitched up in an attempt to clear the fence. The glider struck the fence damaging both wings. *NTSB ERA25LA181*

The CFI rated pilot and student in a SGS 2-33A were not injured while the glider was substantially damaged after landing in an orchard. The CFI reported that while turning final the glider experienced a 'Loss of Lift' (*editors comment*, *wind gradient*) and there was not sufficient altitude to make the runway. The glider struck several small trees during the landing roll in this orchard. *NTSB WPR25LA138*

The private pilot in an SGS 1-26C glider was not injured while the glider was substantially damaged after he landed long and ran off the end of the runway. The pilot reported while approaching the airport with the intention of landing on Rwy 27 he encountered unexpected lift. He then entered a side slip to increase the descent rate which caused the glider to descend lower than expected. The pilot then switched to landing on Rwy 9, but was high and landed about two-thirds of the way down the runway. The left wing was damaged after impacting terrain of the end of the runway. *NTSB CEN25LA202*

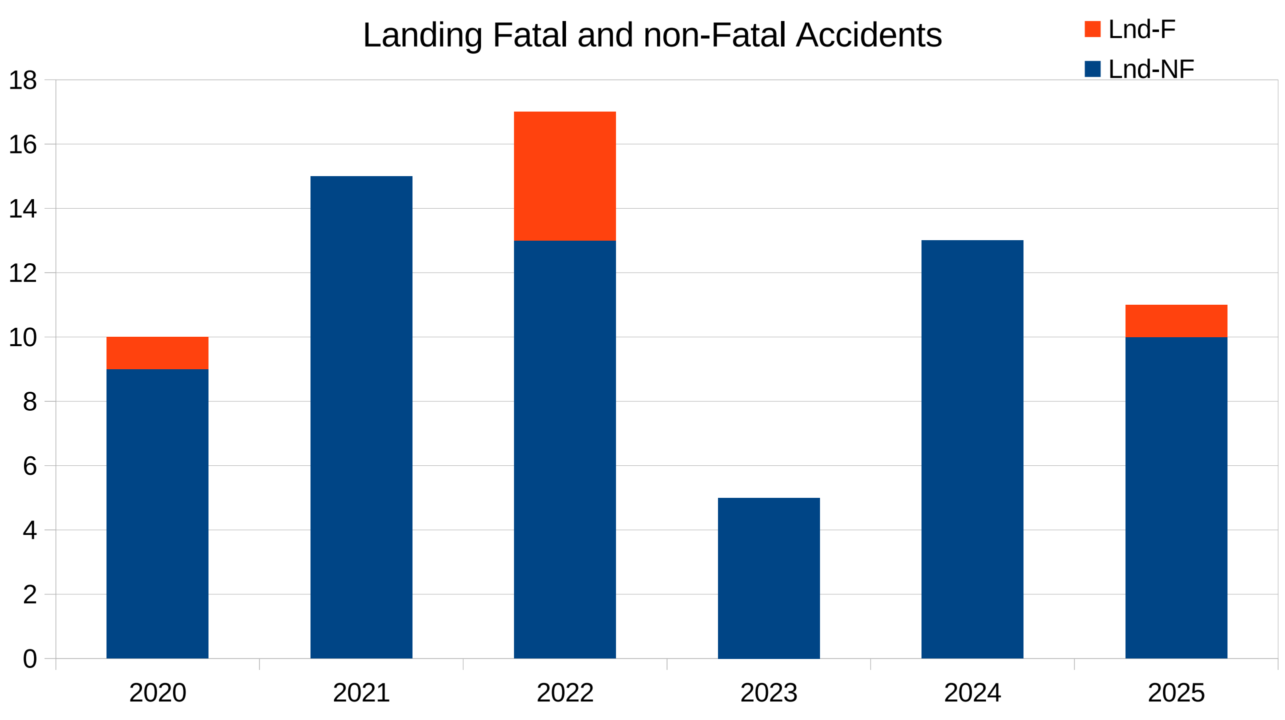

Figure 10: Number of Fatal and Non-Fatal Landing Accidents

The private rated pilot in a LS-7WL glider was not injured while the glider was substantially damaged after striking a gravel surface while conducting an off-airport landing. The pilot reported the promising clouds did not provide the expected lift and he was unable to glide back to the airport. During the landing roll, the gliders wingtip struck a raised gravel surface causing the glider to ground loop, damaging the fuselage. *NTSB WPR25LA177*

The student rated pilot in a Grob G-103 was not injured while the glider was substantially damaged while landing at the home airport. The pilot reported that during the landing flare the glider lost lift and landed hard. There was substantial damage to the lower fuselage. *NTSB CEN25LA227*

The ATP rated pilot in a PW-5 was not injured while the glider was substantially damaged while landing on a closed runway. The pilot reported that he was unable to return to the home airport so he decided to land on a closed runway at another airport. During the landing roll the right wind struck a metal fence post. This caused the glider to pivot and the left wing struck the barbed wire itself. The pilot noted that the fence post was not visible due to high vegetation. NTSB CEN25LA271

The private rated pilot and passenger in a Grob Twin Astir were not injured while the glider was substantially damaged after a ground loop caused by tall grass. The pilot reported that he encountered turbulence and rotor during tow and ‘bad sink’ after the release. The pilot then noticed that the spoilers were open, and closed them. Still sinking to fast, the pilot flew to an alternate airport and entered the landing pattern, instead performing a straight in approach, despite being low. The glider did not have sufficient altitude to complete the landing so the pilot diverted and landed in a nearby field. A ground loop occurred during the landing roll when it encountered tall grass. *NTSB ERA25LA287*

The Student rated pilot in a SGS 2-33A received minor injured while the glider was substantially damaged after impacting terrain during the base to final turn. The pilot reported that while on downwind she was lower than expected so she turned base early. She reported being task saturated and did not maintain proper descent or airspeed control The glider came to rest upright on a grass field short of the runway. NTSB CEN25LA311

The Commercial rated pilot in a JS-3 Jet motor-glider was not injured while the glider was substantially damaged after landing in trees short of the runway. The pilot reported that after returning from a contest task he deployed and started the jet sustainer engine to obtain a recording for the contest scorer. After shutting down the engine he failed to properly stow it. While on downwind and configured for landing the pilot noted a higher than expected descent rate. He changed the flap setting, inadvertently moving it to full negative and fulling opening the spoilers. This put the glider below glide slope and the pilot realized that it would be impossible to clear the trees at the end of the runway. The pilot leveled the wings and landed in the trees. *NTSB ERA25LA354*

The Private rated pilot in a Standard Libelle glider was not injured while the glider was substantially damaged while performing an off-airport landing. The pilot reported that he did not have sufficient altitude to reach the airport and a off-airport landing was the only option. During the landing roll on rough terrain, the glider ground looped causing the gear to collapse. NTSB WPR26LA010

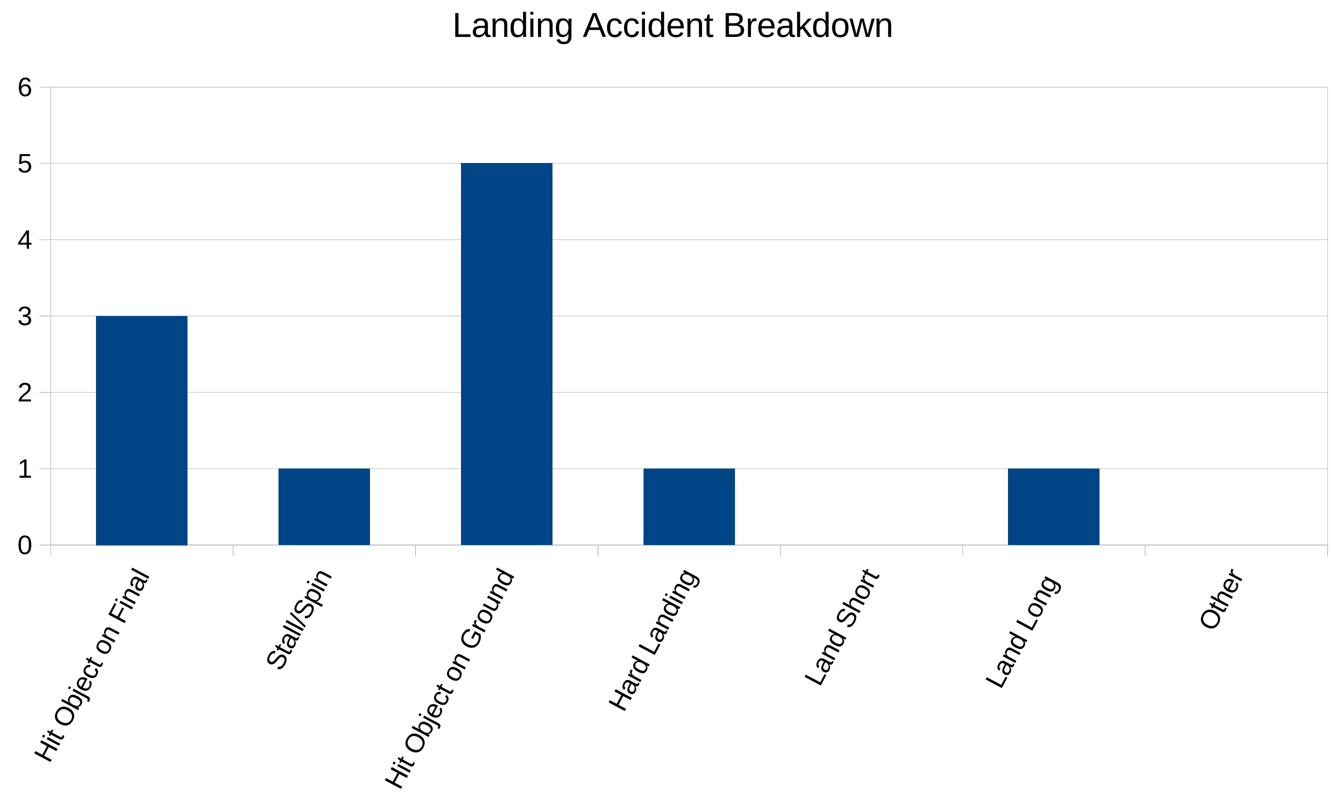

Figure 11: Reported factors in landing accident

The one (1) fatal landing accident reported in the FY25 reporting period is reported in the **Fatal Accidents** section of this report.

Even pilots on local flights must use good Aeronautical Decision Making/Risk Management (ADM/RM) skills to consider the possibility of an off-airport landing. Picking a field that has sufficient length even when obstacles like trees and power lines exist is a primary task. Being able to judge the landing without reference to the altimeter and without reference to specific objects on the ground (e.g., turn base over the field where Joe's garage used to be) are essential skills all pilots need to develop.

Picking a landing field based on the ease of the retrieve vs the safety of the landing has led to many accidents and incidents. It is always better to land and stop safely and then figure out how to get the glider to the trailer.

Scenario based training techniques can be used to help pilots develop the necessary ADM/RM skills they need. In addition, the SSA ABC/Bronze Badge program can help all pilots develop the piloting skills needed to make off-airport landings. The Bronze Badge program requires the pilot demonstrate some soaring skills (two – 2-hour flights) and the landing skills (spot landings and landings without reference to the Altimeter). Talk to your clubs/schools SSA-Instructor (SSAI) to participate in this program and develop/demonstrate proficiency in your skills. As an added bonus, you can earn WINGS credits for completing each badge.

Remember, that all skills atrophy if not used so practice them on a regular basis. Make every landing a spot landing. Don't allow yourself to simply 'stop somewhere on the airport'. Before launch, or before entering the pattern, pick a specific stopping spot on the runway. Then use the skills you developed during your primary training to land and stop at this spot. Talk to you instructor if you have trouble accomplishing this task and re-develop these skills to proficiency. Remember you demonstrated these tasks to the pilot examiner when you initially earned your pilot certificate.

Another fun way to practice is to hold a spot landing contest. Pick an afternoon when conditions are calm and put an orange highway cone on the runway. Give everyone a pattern tow and have classes for students, private, and commercial pilots. See who can get the closest without overrunning the cone. You may be amazed with the results.

Fatal Accidents

Two (2) glider pilots and one (1) tow pilot were involved in fatal accidents during the FY25 reporting period. This represents an 50% increase in the number of fatal accidents (3 vs 2) from previous reporting period. All of these accidents are still under investigation. Preliminary reports show the following.

The pilot in an ASW-24 glider was fatally injured and the aircraft was substantially damaged after it impacted terrain in a nose down attitude. A witness reported that the accident pilot flew for about 1 hour and was returning to the airport with the intention of landing. The glider appeared to be slow as it approached the airport at about 1,000 ft AGL. The glider then stalled and entered a spin, recovered about 50 ft AGL and entered a secondary stall spin before impacting terrain about ½ mile from the airport. This was the pilots first flight after completing the transition training into a high performance single seat glider. *NTSB ERA25FA066*

The pilot in an PA-25 Pawnee tow-plane was fatally injured and the aircraft was substantially damaged after it impacted terrain while towing a glider. The glider pilot reported that around 1,500 ft AGL the glider was high and he pulled the release twice without success. Witnesses on the ground reported that the glider kited between 500 and 600 ft AGL putting the Pawnee in a nose low pitch attitude. The glider then returned to the airport while the Pawnee impacted terrain in a 50 deg nose down pitch attitude. The throttle was found in the idle position, and the rope had been dropped shortly before impact. Investigation of the glider showed the 7 ft long weak link broke and remained attached to the glider. *NTSB CEN25FA248*

The pilot in an ASW 27-18 (ASG-29) glider was fatally injured and the aircraft was substantially damaged after it impacted mountainous terrain. A fellow pilot reported that the 2 gliders were supposed to hook up and fly together that day. The accident pilot launched first and the second pilot arrived in the area a short time later. The second pilot was unable to contact the accident pilot via radio and did not see it on his FLARM display. A visual scan finally found the glider wreckage on the mountain side before it was consumed by fire. The second pilot notified first responders and returned to the airport for a landing. *NTSB WPR25FA232*

Fatal Accidents 2021 - 2025

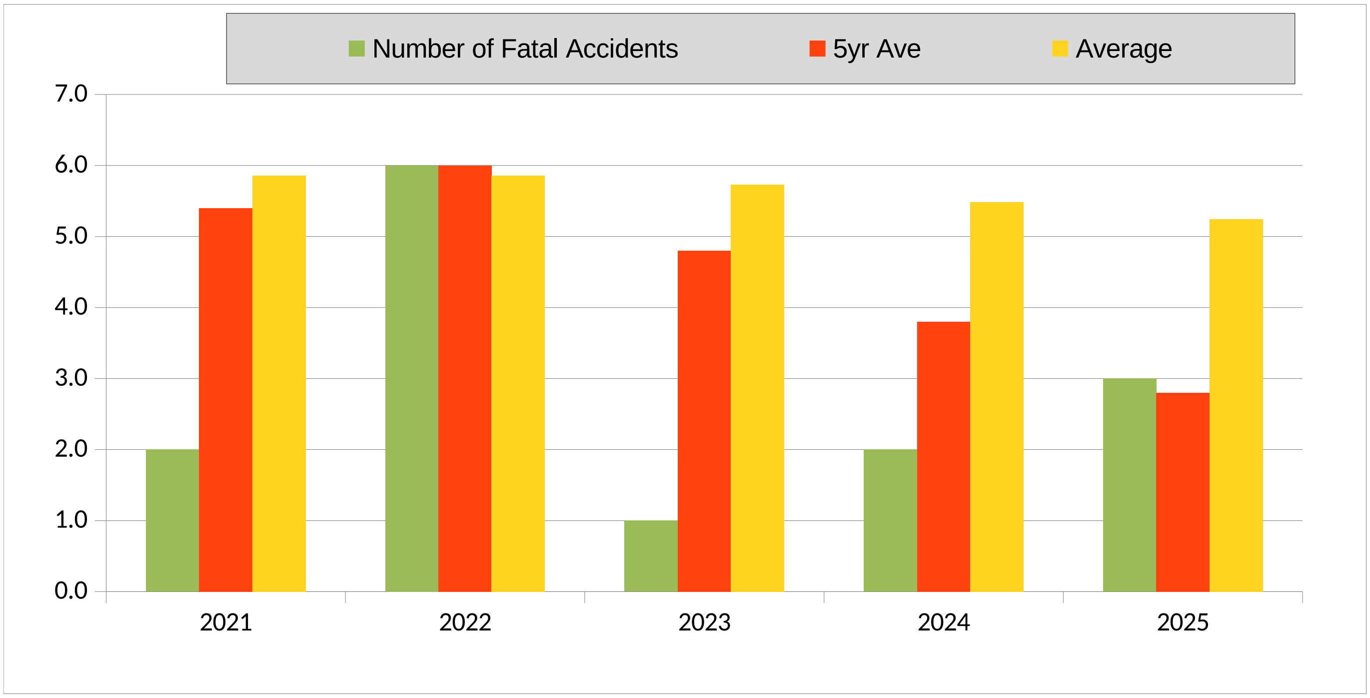

Figure 12: Number of fatal accidents, 5 year average, and average since 1987

It should also be noted that this report continues showing the breakdown of fatal and non-fatal accidents in the launch, cruise, and landing phase of flight. Figures 8, 9, and 10 (above) show the number of non-fatal accidents (blue column) and the number of fatal accidents (orange column). The total number of accidents is the sum of both fatal and non-fatal accidents. Figure 12 shows the number of fatal accidents in all phases of flight. The green bar shows the number of fatal accidents that occurred during that year, the red bar is a moving 5-year average, while the yellow bar is the average starting from 1987 to the year shown in the X-axis.

For the five-year period 2021 – 2025, Fourteen (14) pilots received fatal injuries while soaring. This equates to a five-year average of 2.8 fatalities (2.8 fatal accidents) per year, a significant decrease in the number of pilots and passengers lost from the previous 5-year period. The data shows the long-term average of 5.2 fatal accidents per year since the SSF began collecting fatal accident data in 1987. While the current 5-year average is down from the initial rate of 7.2 fatal accidents per year recorded in 1991 (1987-1991), the long-term trend still falls short of where we need to be. All glider pilots need to evaluate their skills and procedures with an eye toward determining how we can eliminate fatal accidents from our sport.

In 2011 the SSF began taking a closer look at fatal glider and tow-plane accidents. From FY02 – FY25 there were 118 fatal glider or tow-plane accidents in the US involving 115 pilots and 21 passengers in 124 aircraft (mid-air collisions account for the additional aircraft). The NTSB database contains a probable cause (PC) for 115 of these accidents leaving 3 most recent still under investigation.

Figure 7 shows the percentage of fatal accidents in the 3 major phases of flight (launch, cruise, and landing) from FY20 thru FY25. It is instructive to compare these percentages to the percentage of accidents as shown in Figure 5. While the majority of accidents occur in the landing phase of flight and the fewest percentage of accidents occur in the cruise phase of flight, fatal accidents show a completely different trend.

Starting in FY21, a shift has been observed in where the percentage of accidents in each phase of flight resulting in fatal injuries to the pilot and/or passenger. Prior to FY21, the Cruise phase of flight had the highest percentage. After FY21, no fatal accidents occurred in the Cruise phase of flight. This has led to the Launch phase of flight having the highest percentage of accidents result in fatal injuries to the occupants.

Figure 13 shows the breakdown of probable causes for all fatal accidents from FY02 to FY25. The breakdown of probable causes falls into 11 major areas, with a 12th (no P.C. - Probable Cause) meaning the accident is still under investigation. It is informative to see the majority of fatal accidents occur after the pilot lost control of the glider and it stalled and/or spun. As described later in this report, stall/spin recognition and recovery should be a major flight training activity.

The SSF Trustees will continue to work with the soaring community to find ways to eliminate fatal glider/tow-plane accidents.

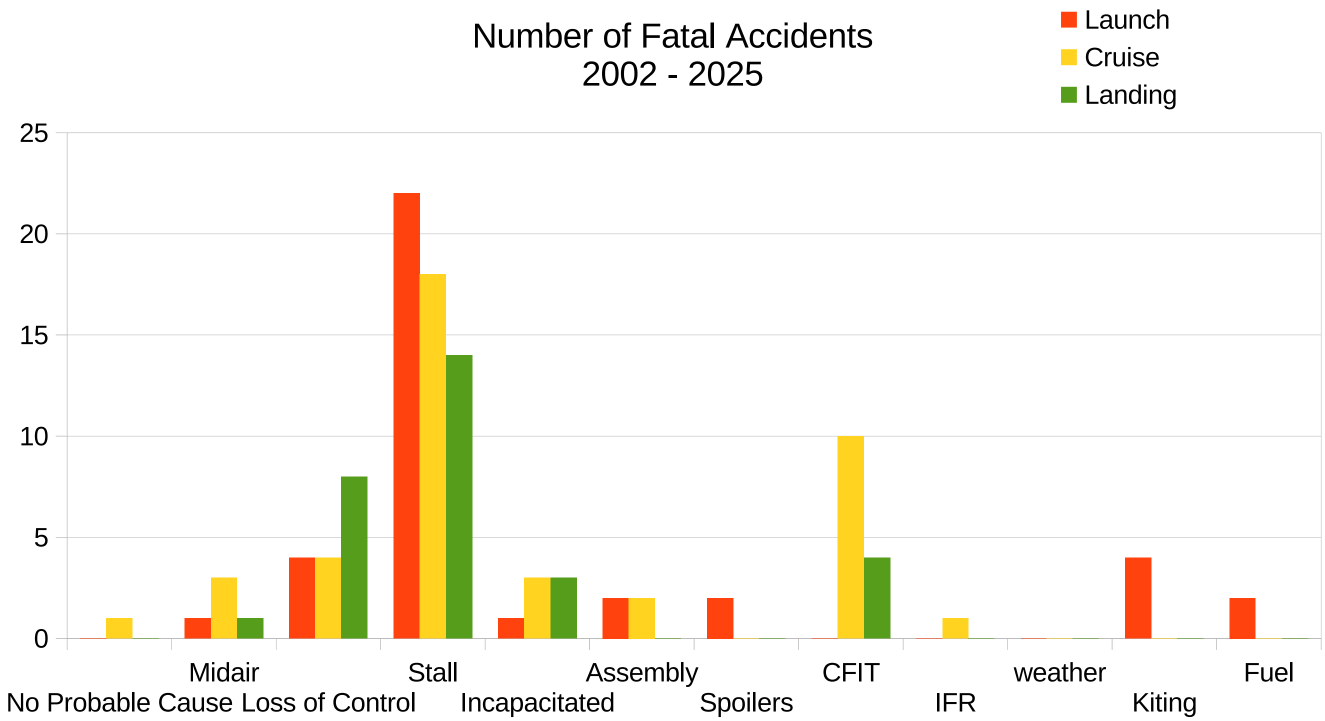

Figure 13: Number of fatal accidents by NSTB defined Probable Cause

Damage to Aircraft

A total of twenty-two (22) aircraft received structural or substantial damage during the FY25 reporting period.

Damaged gliders have a significant impact on club and commercial operators flight operations. Not only is there the immediate issue of dealing with the injuries resulting from the accident but also the long-term impact cannot be forgotten. Typically, the damaged glider will be out of service for several months while it is being repaired. During this time flight operations may be reduced or suspended if this is the operation’s only glider. This can place a significant financial strain on the club or commercial operator and makes it harder for members or customers to obtain and maintain both currency and proficiency.

Auxiliary-Powered Sailplanes

Four (4) gliders equipped with some kind of internal powerplant (gas, jet, or electric) were involved in accidents during this reporting period. In this report a glider that can self-launch, or simply sustain flight after a conventional glider launch has been completed is referred to as a motor-glider. Details of those accidents are reported in the appropriate section (cruise, landing, or damage to aircraft) above. The details of these 4 accidents can be found in the appropriate section of this report.

It should be noted that, while not a factor, in two (2) of these accidents the motor-gliders had self-launched. In one case, the launch method for one (1) motor-glider is not provided.

Accidents Involving Tow-Aircraft

There was one (1) accident involving a towplane in the FY25 reporting period. The description is found in the **Fatal Accidents** section of this report

Accidents with no known cause

There are four (4) non-fatal and one (1) fatal accidents in FY25 for which no known cause has been found. A Grob 102, ASH-30Mi, Blanik L-23, and SGS 1-26B were all involved in some kind of non-fatal accident. An ASW 27-18 (ASG 29) was involved in a fatal accident. As of this report, no details are provided in the NTSB database .

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[4].

Instead of focusing on comparing accidents in one region to others, figure 14 compares the number of accidents in each SSA region with the average number of accidents in that region during the previous 16 years (FY10-FY25). Figure 15 shows the same information for fatal accidents during the same periods.

[4] See Appendix A for more details

As can be seen, accidents occur in all regions. Due to the different geography across the US, it is difficult to compare one region against the other. However, it is possible to see how each region compares to its historical trend. The intent of these graphs is to show how the current reporting period compares to the historical trend for each region.

A strong ‘safety culture’ is a large part of the solution to reducing the number and severity of glider and towplane accidents. Every pilot must continuously evaluate the ground and flight operations with an eye toward preventing incidents from becoming accidents.

The SSF web site contains an incident reporting form (http://www.soaringsafety.org/incident.html) that individuals can use to anonymously report issues that might impact a pilot’s or passenger’s safety. The SSF will use this information to aid in identifying trends and to formulate procedures to assist pilots and instructors in preventing future accidents.

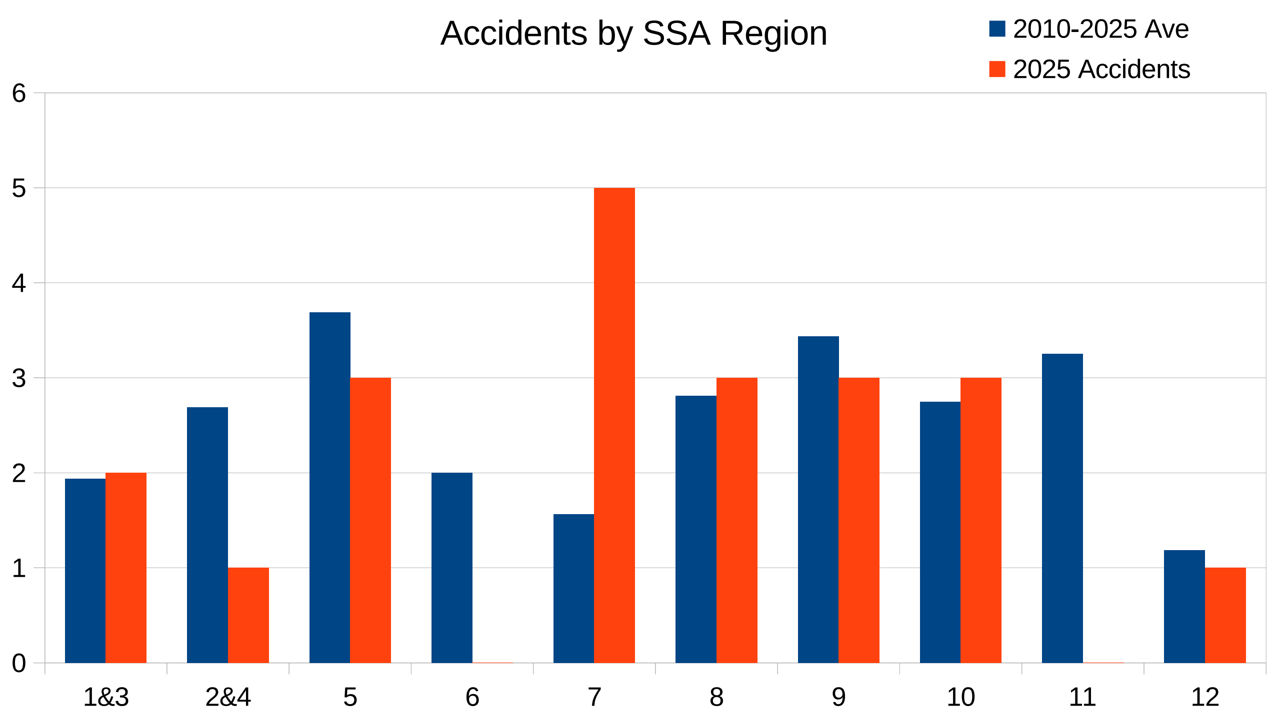

Figure 14: FY25 and average Number of accident per SSA Region

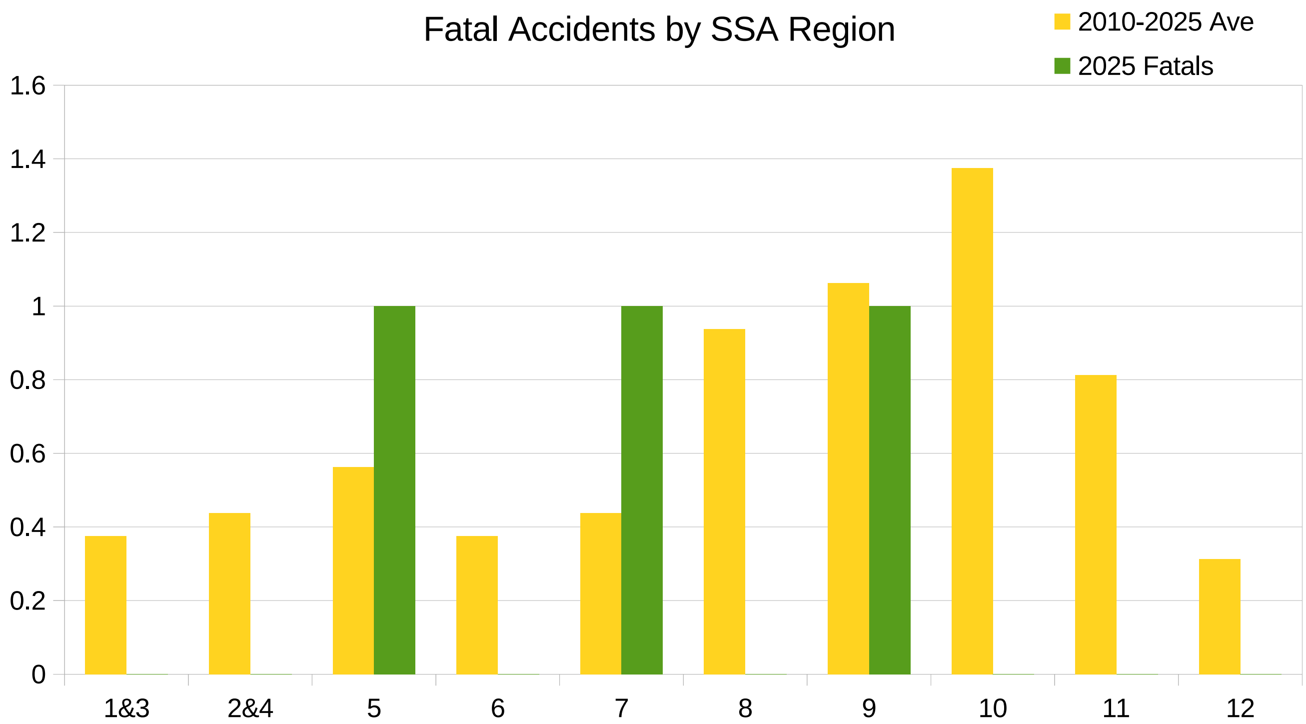

Figure 15: FY25 and Average number of Fatal Accidents per SSA Region

Flight Training and Safety Report

The SSF generates this safety report based on data extracted from the NTSB aviation accident database. We also receive summary and trend information from the SSA's group insurance program. Slow, long-term progress continues to be made. The number of claims fell 6% from the previous year. Obviously, there is a lot more we all need to do to reduce the number of accidents and claims.

First and foremost, we all need to accept the fact that the causal factor behind most glider and towplane accidents is the Human Error factor. The question then is what does this mean?

In some cases, it means that the pilot does not have the necessary skills to control the glider within certain parameters. An example would be failure to maintain a constant airspeed when making a steep turn. With instruction and practice the pilot can develop the skills needed to perform this maneuver.

In some cases, it means that the pilot does not have the necessary aeronautical decision making skills (ADM) to recognize the risks that arise from a specific action. An example would be failure to pick and maintain the proper approach speed when landing into a decreasing headwind (e.g., a wind gradient). With instruction and practice the pilot can learn how to make the decision in order to make a safe approach and landing in these conditions.

In some cases, it means that the pilot had the necessary skills and ADM knowledge, but failed to apply good Risk Management (RM) skills to mitigate those risks. An example would be that the pilot attempts to make a low altitude save because a land out and retrieve would mean getting home much later than expected.

In some cases, it means that the pilot has succumbed to a condition known as 'Normalization of Deviance'. This means that the pilot has successfully gotten away with a risky behavior (e.g., climbing up from 600 ft AGL) so a new tolerance limit is set at a lower level (e.g., going down to 500 ft AGL is now acceptable).

In some cases, it means that the pilot was trained incorrectly and when stressed the 'Law of Primacy' kicked in and the pilot acted as trained. An example would be always attempting to return to the runway following a failed launch, even when landing straight ahead was the better option.

Aviation safety experts consider the cause of an accident to be Human Factors when any or all of these factors are at work. What is important to understand is, that with training and practice we can develop the skills to recognize when we are susceptible to falling into a Human Factors accident chain. Constantly practicing those skills can significantly reduce the accident rate in the U.S. Thus, building and maintaining a safety culture where everyone involved in the organization holds themselves and others to the standards agreed upon by those members is the best safety action you can take.

According to Sidney Dekker[5] author of "The Field Guide to Understanding Human Error" we all need to accept the, apparently, radical view that simple human error is not the cause of an accident. Rather, the error is a symptom of a deeper problem (education, knowledge, and proficiency). If we accept this view, then we can begin to identify the underlying causes that lead to the accident and fix them.

Imagine that a pilot is involved in a near-miss incident due to a failure to see and avoid the other glider. If a pilot fails to clear his turns, then how many times did he successfully make turns without looking? It could be thousands. Thus, the problem is not simply that the pilot failed to clear his turns, <u>the problem is that the flight instructor(s) he trained with failed to emphasize the importance of this task.</u> The operations training syllabus may not have emphasized this task and instructors may not have been given the post-flight time to evaluate and critique the pilot's actions on this critical skill. The flight instructor(s) also failed to catch this sub-par performance during recurrent training (flight review) and fellow pilots failed to critique the pilots performance of this critical task if/when it was noticed.

It is this structural problem with the organizations initial and recurrent training programs that needs to be fixed. Thus, the solution is to ensure that pilots are taught to clear turns and that their proficiency at this task is verified on a regular basis.

If a pilot continues to fly a 'normal' landing pattern despite being low, how often has the pilot been put in this situation during training or recurrent training? Again, the problem is that the soaring operations training syllabus did not provide the pilot with the skills needed to recognize both normal and abnormal landing patterns. The syllabus did not allow the instructor the time to practice multiple normal and abnormal approaches to build the pilots proficiency levels up to the point they should be. The operation also failed to notice, and provide the recurrent training necessary to correct this poor performance. The solution is to ensure that the pilot is trained to modify the pattern as necessary to deal with normal and abnormal situations. This can be easily accomplished through the use of scenario based training (SBT) which allows the instructor to evaluate a pilot's response to different scenarios as presented.

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5 Professor of Human Factors and System Safety at Lund University, Sweden and Director of the Leonardo Da Vinci Laboratory for Complexity and Systems Thinking.

This view of human factors errors, combined with Safety-I and Safety-II analysis methods,can help us break through the accident plateau we currently suffer from. However, it will take an effort from each of us to examine our operations both initial and recurrent training program to determine what is broken and how to fix these problems.

SSF Trustee Action: Safety-II concept

In December 2022 the SSF was introduced to the Safety-II concept, which can be viewed as an enhancement to our current Safety-I programs. To understand how Safety-II enhances Safety-I, it is informative to look at how safety programs have developed over the past 70 years.

In the early to mid-1950's, general aviation grew at a tremendous rate, with a commensurate increase in aircraft accidents. This led the FAA to begin writing more rules and regulations to deter pilots from engaging in unsafe activities. We have all heard the line 'that regulation was written in blood'. Meaning that a fatal accident had occurred, the accident review determined the probable cause, and a regulation was written as a deterrent to other pilots performing this action. This response worked well for the next few decades.

However, in the mid to late 1970's, experts noticed that the number of accidents was not decreasing as rapidly as before. This led to the focus on Human Factors as a major cause of accidents. The aircraft structures and engines were not failing as often as before and it was recognized that pilots making mistakes or failing to recognize hazards and risks were major causal factors. This led to the regulatory requirement that pilots be trained in Aeronautical Decision Making. Programs which introduced the 5 Hazardous Thoughts (Anti-Authority, Invulnerability, Invincibility, Macho, and Resignation) and their antidotes and the IMSAFE (Illness, Medication, Stress, Alcohol, Fatigue, and Emotion) checklist are 2 examples of ADM skills pilots can learn. The learning of ADM and Risk Management (RM) skills have made a significant positive impact on reducing aviation accidents.

However, as we reach the middle of the 3rd decade of the 21st century we again see a plateauing of aviation accidents. This has lead aviation safety experts to develop additional safety management programs, specifically one called Safety-II.

As defined in "Safety-I and Safety-II; The Past and Future of Safety Management by Erik Hollnagel[6]" traditional, or Safety-I, programs operate under the definition that 'Safety is the condition where the number of adverse outcomes (accidents/incidents/near misses) is as low as possible'. This means we count the number of accidents and incidents and develop programs to reduce this number. We consider this year safer than last year if the number goes down year by year.

In contrast, Safety-II is defined as 'The condition where the number of successful outcomes is as high as possible'. This means that we recognize that we, as pilots, will make mistakes. Reporting when we do, and effectively using that report in a Safety-II program is the challenge we face.

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[6] Erik Hollnagel Professor, PhD. Professor Emeritus Linköping University Sweden,

One method is to encourage pilots to report when things go well. That is a hard challenge as when things go well, what is there to report? As the scenario below indicates, there is another method that shows promise. When a failure or mistake is reported, try and determine a failure rate instead of simply a failure number. The opposite side of this failure rate is a success rate. The goal is to make this success rate increase year after year.

A rising number of reports does not indicate more mistakes are happening, just that reporting is better reporting is happening. Currently, most of the time no report is given and thus the knowledge is not shared with the club members or commercial operators staff/clients.

Safety-I is our communities' current method where we look for problems, analyze them to identify causal factors, and implement corrective actions (i.e.; new rules, training, re-training, procedures, enforcement, etc.) and maybe a failure rate. Moving to a Safety-II program requires a different mindset.

Consider the following scenarios and how the Safety-I and Safety-II program augment each other.

> A glider club has 2 ASK-21 gliders primarily used for student training. In the past 2 years those gliders flew 1900 times. Some of the students require that ballast weights be installed to meet the manufactures minimum 154 Lb front seat weight. Those weights, each weighing 2.2 Lbs, fit to a bulkhead ahead of the front seat. A total of 12 weights (6 per side) can be fitted, and the flight manual contains a table showing the correct number based on the pilots weight. Assume that in 5% (95) of these 1900 flights students were required to install weights.
>
> The club has a reporting system and in 6 cases a report was made that an unsecured ballast weight was inadvertently left in the glider. This unsecured weight was found after the glider flew several more times.

A Safety-I incident analysis system would state two probable causes:

1. The student failed to remove all the weights they installed in the glider.
2. A pilot failed to find this unsecured weight.

Both of these causes focus on the negative. One lesson learned is that the proper use of checklists is essential for the safe operation of the glider. This is a Safety-I response/ The club's safety is increased when these failures are reduced.

Unfortunately, we all will make a mistake sometime or get distracted while doing the checklist, or become complacent and simply mouth the words without actually taking the appropriate actions. While your instructor can teach and enforce checklist usage, they can't guarantee that a pilot will not make a mistake sometime in the future. Also, do you really think the pilots involved did not know the value and importance of using the checklists?

Let's look at this scenario from a slightly different perspective.

Given our assumption that 6 of 95 times a weight was left in the glider also means that 89 times all the weights were successfully removed. Looking at that as percentages we see a 6% failure rate and a 94% success rate.

Safety-II analysis program says don't just look at the failures, look at the successes!

In this case we can look for reasons why the majority of time these 2 positive actions took place:
1. The student properly removed all the ballast weights.
2. A pilot found the unsecured weight.

Was it a better use of checklists by these pilots? Better initial training? A lack of distraction during the post-flight or pre-flight inspections that allowed these pilots to succeed? A Safety-II response says that increasing the number of successes will increase the club's safety.

To fully develop a response to these incidents, all 4 of the issues need to be examined. The 2 failures, not removing and not finding ballast weights are just half the problem. Identifying the what led to successfully removing or finding ballast weights can also help generate processes and procedures that increase the success rate.

Note that while this scenario describes a failure, a deeper analysis shows that it is more an anomaly than the common successful occurrence. That is a method you can use to implement your own Safety-II program. Look at an incident, near-miss, or accident and determine how often a similar situation resulted in a successful outcome. Thus, you generate the success and failure rates, not just the number of failures. Then when you analyze the all versions of this event to find the probable success and failure cause(s).

A key to both Safety-I and Safety-II programs, is knowing what is going on. Having a method to capture incidents, near-misses, and accidents is an essential step in any safety program. Without a reporting system, clubs and commercial operators rely on word of mouth and memory to understand when not operating safely. The SSF is currently working with the community to develop a simple reporting system that clubs and commercial operators can use. More details will be provided as they become available.

The SSF trustees and advisors are working with the international gliding community to better understand how Safety-II concepts can be implemented and used by the U.S. Soaring community. Updates will be presented in articles and presentations as that knowledge is gained.

SSF Trustee Action: Glider flight Data

As noted earlier in this report, the SSF accident reports have historically reported on the number of accidents that are reported to the National Transportation Safety Board. The SSF Trustees search the NTSB aviation accident 'Carol' database several times a year to collect accident reports and identify accident trends and probable causes. The SSF trustees started capturing NTSB data in 1981 and have continued to do so annually for the past 44 years.

However, while this data can show trends, it does not show the accident rates that are commonly shown in General Aviation or Commercial aviation publications. To have statistically meaningful data you need to have both the number of accidents and the number of flights or flight hours. Without that flight/time component you can't tell if the raw numbers are decreasing because pilots are making better decisions or because pilots are flying less.

Getting flight hour data has stymied the SSF since it was formed in 1981. Try as we might, the community has been unable or unwilling to reliably submit flight hours to the SSF. However, getting this data is crucial to understanding if the decline in accident numbers is due to a lower accident rate or just fewer pilots flying fewer hours.

At the 2018 Soaring Convention the SSF Chairman gave a presentation on the U.S. glider accident rate, using several proxies and assumptions. The presentation, available on the http://www.soaringsafety.org/presentations/presssa.html web page. It shows how these proxies and assumptions were generated and what they say about accident rates. The absolute number given by these proxies and assumptions is suspect, or flat out wrong, but all of them show the same trend. The Accident Rate for gliders has been declining for the past few years.

Since that time, the SSF has continued to gather raw accident numbers from the NTSB database and flight hours/launches from both the FAA survey data and data submitted to the SSF via our annual postcard request. A comparison of this data is shown below.

FAA Survey Data:

Every year the FAA sends a random subset of glider owners (pilots, clubs, and commercial operators) a letter or postcard requesting that they go on-line and fill out a usage survey. This survey data is then placed on the FAA web site and the files can be downloaded for review. This data shows that U.S. glider pilots have flown an average of 102,412 hours/year between 1999 and 2021. This has ranged from a high of 157,831 hours in 2002 to a low of 50,352 in 2020. This accident rate, based on this FAA data, is shown in figure 16 (accident rate per 100,000 hours/year and launches/year).

2024 Update: in the fall of 2023 the SSF trustees realized that the FAA survey data separates aircraft with experimental airworthiness certificates from those with standard airworthiness certificates. For GA as a whole, this does not have a large impact on the flight hours or launch numbers as experimental airplanes are a small percentage of the GA fleet. That is obviously not the case for the soaring community. According to the FAA records in 2022 there were a total of 4,706 gliders registered with airworthiness certificates. Of those 717 were experimental/home built, 970 were experimental/exhibition, 28 were Light Sport, 251 were experimental/other and 60 were special Light Sport. This means a total of 1,938 gliders held some type of experimental airworthiness certificate. The FAA then accounted for 67 gliders not in the U.S. or not airworthy. This left 2.603 gliders with standard airworthiness certificates in the U.S.

Thus approximately 41% of the glider fleet use some type of experimental airworthiness certificate. Those flight hours and launches are not included in the numbers used to create the data in Figure 16. The SSF is working with the FAA to find ways to obtain this missing data.

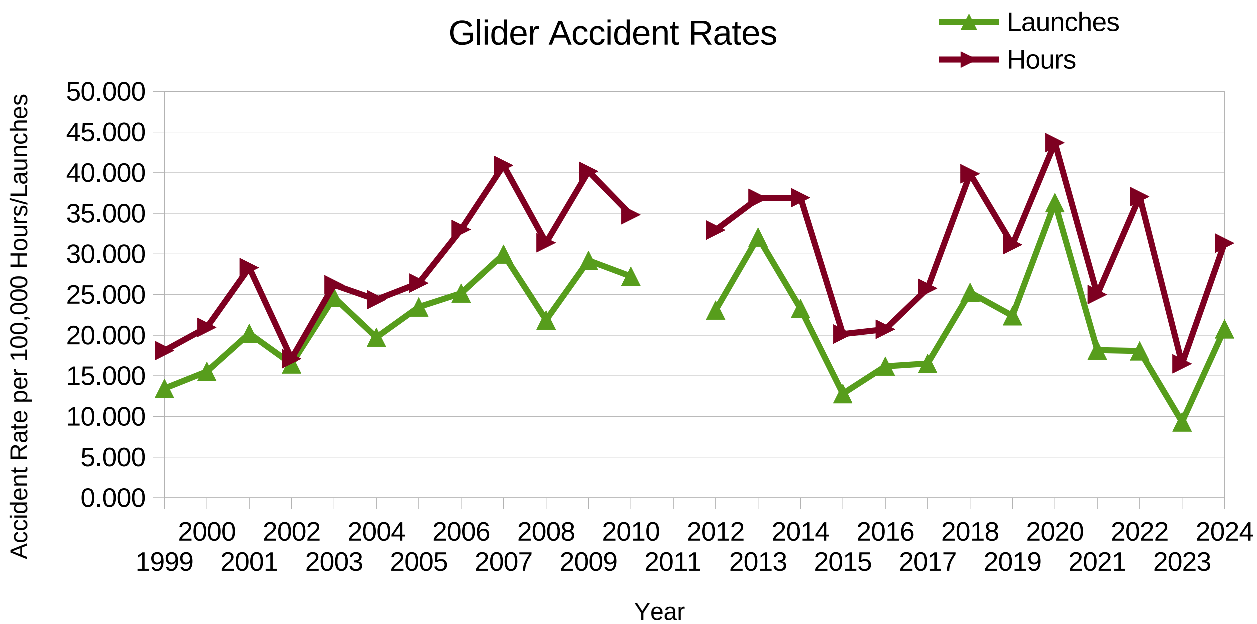

Figure 16: Glider accident rate based on FAA survey data

SSF Survey Data:

For the past 8 years the SSF has been asking clubs, chapters, and commercial glider operators to complete an anonymous and confidential usage survey. In late January or early February, the SSF requests a list of mailing addresses from the SSA office in Hobbs, for all soaring organizations and mails them a letter and postcard seeking that organizations flight information. So far approximately 30% of those organizations respond by returning the postcard to us. Now it is time for every club, chapter, and commercial operator to step up and help the SSF obtain this missing data. What is the real glider accident rate in the U.S.?

Figure 17 shows the accident rates (per 100,000 launches and hours) based on the data collected by the SSF. Clubs, chapters, and commercial operators who return their postcards. Comparing figures 16 and 17 helps demonstrate the value of returning your postcard.

The SSF contacts every club, chapter, and commercial operator, via the US postal mail asking that they annually submit, on a voluntary basis, the following 6 pieces of information:

A) The number of gliders located at your field
B) The number of club/commercial gliders located at your field
C) The number of tow-planes and/or winches at your field
D) The number of launches (broken down by type) you gave
E) The number of club/commercial glider launches you gave
F) The number of hours your club gliders flew

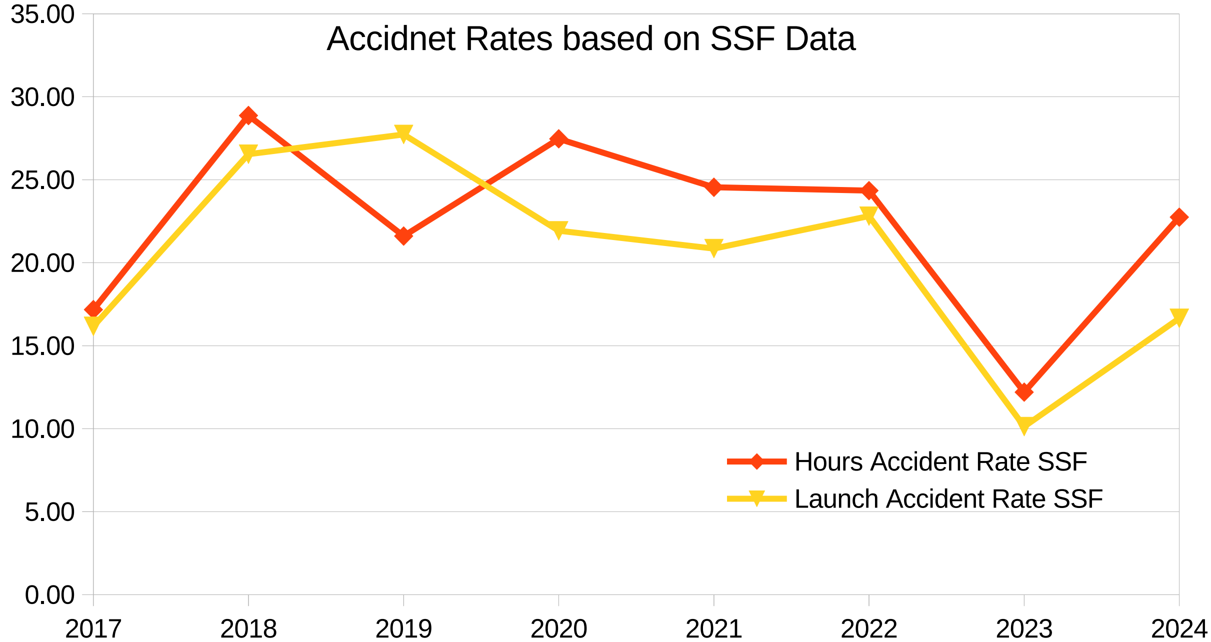

Figure 17: Accident rates (per 100,000 hours or flights) using SSF Club/Commercial provided Data

You will notice that we are not asking for the number of hours the privately owned gliders fly. We realize that the club or commercial operator probably doesn't have that information. The SSF will attempt to estimate those hours in other ways.

Figure 18 compares the flight hours and Figure 19 compares the number of launches between the data extracted from the FAA Survey data and that obtained from clubs, chapters, and commercial operators responding to the SSF's annual postcard request. Up until 2020, the number of launches reported by these member organizations had been tracking closely with the numbers found in the FAA survey. Since we expect that these organizations do not have good numbers on private glider flight times, the SSF calculates private hours by taking the average length of a club flight and estimating that a private flight is 4 times longer. In 2020 the SSF switched from this method to a flat 3 hours per launch. This matches the long-term average in SSA sanctioned contests. Given that about 30% of the member organizations respond, the total number of hours and flights is calculated by multiplying the sum total of the reported hours and flights by 3.

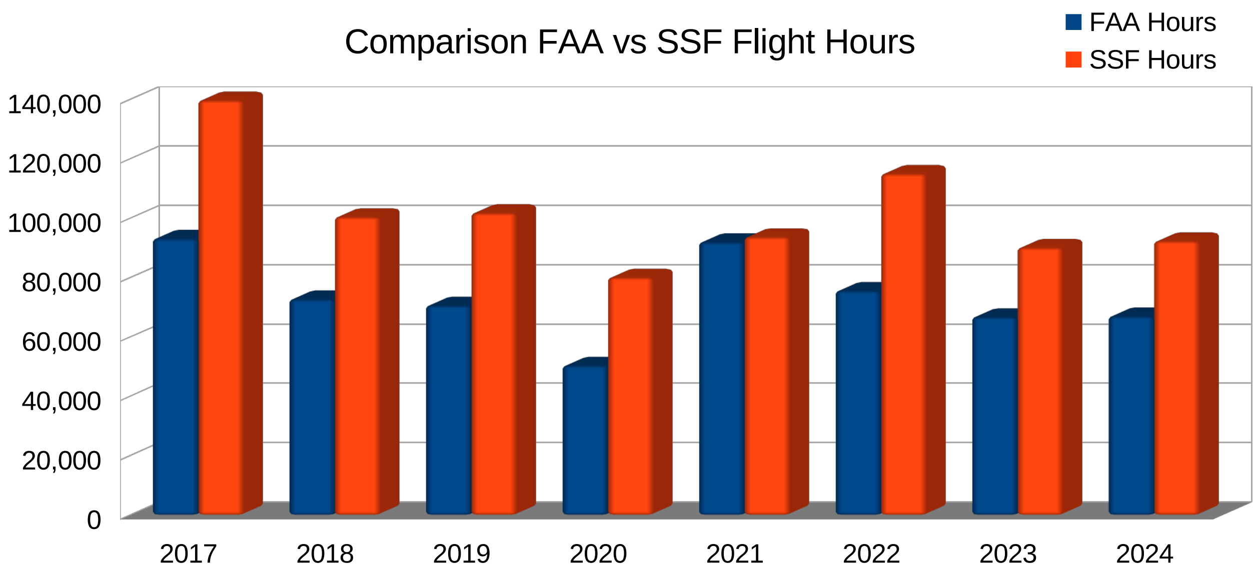

Figure 18: Comparison of flight hours between FAA survey data and SSF postcard request data

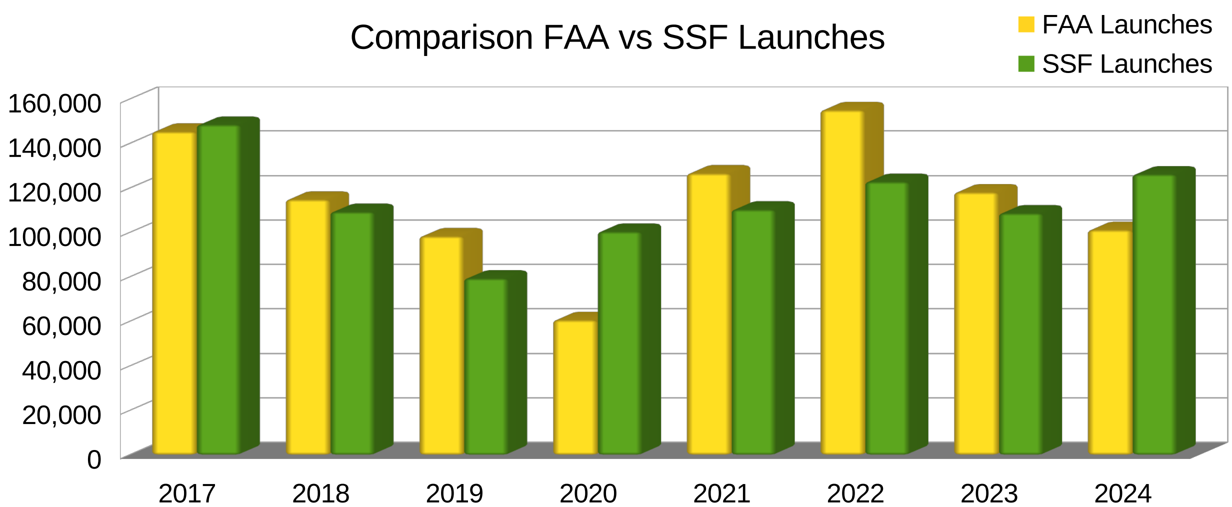

Figure 19: Comparison of launches between FAA survey data and SSF postcard request

The accident rate data shown in figure 20 illustrate how the rates calculated using the FAA's survey data or the SSF's postcard data can dramatically diverge. As seen in figures 18 and 19, the FAA survey data shows a significant decline in operations that is not shown in the SSF annual postcard data. This should give everyone pause! Only by getting better data, meaning more clubs, chapters, and commercial operators reporting data in an anonymous and confidential manner can that happen.

Getting real data from the SSA membership will go a long way towards giving us realistic accident rates. We can then compare these rates to our European colleagues to see how we fare. We can compare the data to General Aviation and Sport Aviation communities to see if there are common elements that we can all work to solve. Most importantly, we can demonstrate to ourselves and our community that Soaring pilots really are developing the Risk Management (RM) and Aeronautical Decision Making (ADM) skills needed to fly safely while having fun doing so.

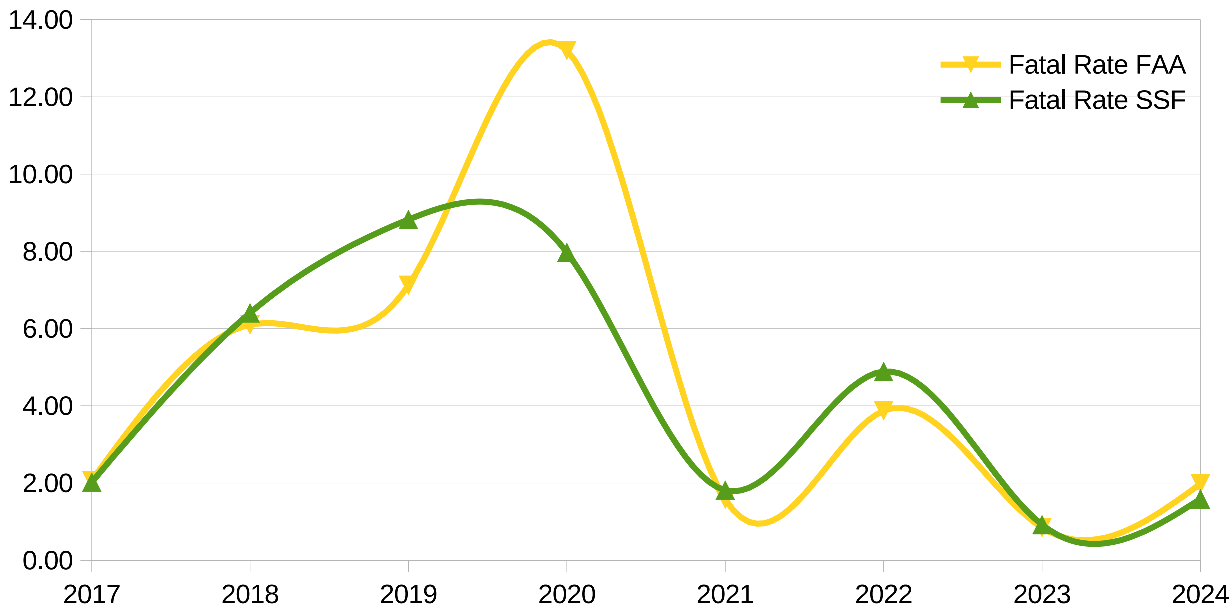

Figure 20: Comparison of fatal accident rates using FAA vs SSF flight time data (fatal accidents/100,000 hours)

So, step up and submit your data. The SSF letter/email will provide details on how to submit your club, chapter, commercial operate data.

Open Glider Network (OGN) Data:

In 2025 the SSF began an experiment to see if it could capture real-time data based on the Open Glider Network (OGN) of base stations and participating gliders. The SSA has encourage clubs and commercial operators to install base stations, and many have. Gliders equipped with FLARM, or an OGN based transmitter send data directly to the local base station. OGN members also scrap public ADS-B databases and personal locator sites and upload that data into the OGN system.

The SSF used scripts found on the OGN developers web site to create a program to extract data from the national group of base stations and calculate the number of gliders sending data into the network, the number of hours these gliders fly and the number of launches they do each day. Year to date and weekly data is now posted on the SSF's web site http://www.soaringsafety.org/index.html In 2025 this script recorded the following:

- 399 glider with Standard Airworthiness Certificates flew 22,634 flights for 20,194 hours
- 513 glider with Experimental Airworthiness Certificates flew 12,884 flights for 22,219 hours

- 26 glider with Light Sport Airworthiness Certificates flew 400 flights for 497 hours
- 99 glider with Unknown Airworthiness Certificates flew 6,689 flights for 5,142 hours
- 2 glider with Other Airworthiness Certificates flew 24 flights for 95 hours
- A total of 1,039 gliders with some kind airworthiness certificate flew 42,631 flights for 48,147 hours
- An additional 2,751 glides without known N numbers which flew 22,097 flights for 15,223 hours
- For a total of 3,790 gliders flying 64,728 flights for 63,370 hours so far this year

The OGN data contains a unique identifier associated with each glider. That identifier may be the gliders unique ICAO hex code assigned to the glider matching it to the N number. It could also be a random number assigned to the OGN transmitter located in the glider. Given that over 2,700 gliders do not have identifiers matching their ICAO hex code, it is not possible to determine if these are unique gliders or multiple gliders with the same identifier. It is also possible that a new random number is used each time a glider flies meaning a fewer number of gliders fly, but the hours and flight numbers are valid.

What can be learned from this data? The analysis below only considers gliders who's identifier matches their assigned ICAO hex number. This makes it possible to extract the airworthiness certificate information from the FAA's aircraft database.

According to the FAA aircraft database there were 2402 gliders with standard airworthiness certificates, 1854 with experimental airworthiness certificates, and 498 with some other airworthiness certificate. This means a total of 4754 gliders registered in the U.S. The FAA survey data estimates that 60% of those with standard airworthiness certificates are active or 1441 gliders. The OGN data shows that 399, or 28%, recorded flights. Gliders in the experimental airworthiness certificate fall into several different categories with 1519 being registered in the, common for gliders, racing/exhibition category. Assuming that 60% of them also flew would mean 56% (513/911) recorded flight.

Table 2 summarizes percentages of hours and flights from those with some kind of airworthiness certificate. As can be seen, more gliders with experimental airworthiness certificates are equipped with some type of OGN transmitter. It is also apparent that those experimental gliders make longer flights than those with standard airworthiness certificates. This makes sense as experimental gliders are typically single seat and are equipped with modern instruments.

Airworthiness Cert	Gliders	Flights	Hours	% Gliders	% Flights	% Hours
Standard	399	22,634	20,194	38.4%	53.1%	42%
Racing/Exhibition	513	12,884	22,219	49.4%	30.2%	46%
LSA	26	400	497	2.5%	0.9%	1%
Other	101	6,713	5,237	9.7%	15.7%	11%
Total	1,039	42,631	48,147	100.0%	100.0%	100%

Table 2: Percent of Flights and Hours per Airworthiness Certificate

Table 3 generates potential flight and hour data based on assumptions that 60% of each category is active and the percent recorded is based on the number found divided by the number active.

Airworthiness Cert	FAA Active	Percent recorded	Estimated Flights	Estimated Hours
Standard	1,441	28%	81,755	72,941.3
Racing/Exhibition	911	56%	22,890	39,474.5
LSA	41	64%	628	779.9
Other	430	24%	28,554	22,275.4
Total	2,823	37%	115,830	130,817.1

Table 3: Estimated Active Gliders, Flights, and Hours per Airworthiness Certificate

Tables 2 and 3 demonstrate the importance of clubs and commercial operators to completing the SSF's annual survey. They also show how pilots responding to the FAA's survey can also help validate the numbers shown in these tables. By comparing the FAA data to the estimated flights and hours in the Standard row we can match OGN data with FAA data. These estimated hours and flights can also be validated by using data generated by the SSF's survey results.

SSF Trustee Recommendation: Planning for Practice PTL Events

An astute reader will have noticed that the SSF has renamed this maneuver as the 'Premature Termination of the Launch' (PTL). This is intentional. The term PT3 has long been associated with a simple 200 ft AGL decision height. While decades of training have used this procedure successfully, the accident record, and specifically the high percentage of launch failure accidents resulting in dead pilots, calls for a change! The discussion below highlights this new training focus. An appropriate analogy is how revised training in launch failures in multi-engine airplanes reduced their high fatality rate after it was realized that original training was more hazardous that real engine failures. The fix, practice those maneuvers at an altitude that allowed a pilot to recover from simple mistakes.

Over the past 6 years a total of twenty-eight (28) accidents occurred during an aborted launch. Ten (10) pilots have been fatally injured during these aborted launch accidents. That is a 36% fatality rate for this maneuver. A review of these non-fatal accidents shows that two (2) were practice events with an instructor onboard, one (1) was a Loss of Control in-flight, one (1) was a distraction during the take-off/tow, nine (9) were Loss of control during the initial portion of the take-off roll, and five (5) were other factors. The fatal accident breakdown is seven (7) Loss of Control in-flight, two (2) where the glider kited killing the tow pilot, and one (1) potential kiting where the glider pilot was killed.

For decades the soaring community has operated under the assumption that the glider can safely return to the runway following a rope break after the glider reaches 200 ft AGL However, as these accidents show, that is not always the case. Pilots must be trained to give more thought to what could go wrong and be prepared to abort the launch before losing control of the glider.

What our glider pilots have learned, either explicitly or implicitly from our training is the first, and probably only, option is to turn around and land back on the runway. These accidents demonstrate that this 'Law of Primacy' training leads to impulsive behavior and serious accidents. It does not matter what altitude the failure occurred at. It also doesn't seem to matter what plans the pilot made before the launch began. The accident occurs after the pilot attempted to return to the runway.

Looking at the training we give in gliders, it should come as no surprise that students and other pilots learned this lesson. Every practice launch failure they had resulted in a successful return to the runway. Most of the time this practice started with the instructor pulling the release at 200 ft AGL. No wonder that these PTL accidents show the pilots impulsive response to return to the runway. That's all they have ever practiced.

To address this problem the SSF has taken 2 important steps. 1) Rename this procedure to move away from decades on inadequate training; and 2) Change the recommended training procedures to incorporate simulator and safer in-flight practice of launch failure maneuvers.

To begin changing community behavior and teaching the proper concepts, the SSF published a series of articles in SOARING (Nov 2025 – Mar 2026). Reprints of these articles are found on the SSF's web site at https://www.soaringsafety.org/publications/soaring-articles.html or the appropriate month of SSA's digital or paper version of SOARING. Those articles cover why the current training is inadequate and how to improve it.

Summarizing those articles.

Start training students and other pilots to accept a field landing by introducing this maneuver using Condor, or similar, simulator training. Using Condor with a high resolution[7] local landscape, allows for a scenario where the towplane waves the glider pilot off at a low altitude. You can also create scenarios where the instructor activates the release or has the pilot activate the release at various points in the launch. The pilot can then land, in a field, or back at the airport, depending on the situation and conditions. Doing this training before conducting similar training in the glider can set the 'Law of Primacy' so in a real emergency the pilot acts correctly.

The instructor can also clarify that this flight training is abnormal occurrence training. It is done in a manner that allows a safe return to the runway. The simulator training allows students and pilots to learn that turning around may not be necessary in a real emergency. The SSA has been pushing Condor simulators with a cost sharing program. Contact the SSA office in Hobbs to learn more about this program.

It should also be clear that the Glider Practical Test Standard (PTS) **DOES NOT** specifically require the applicant to perform a 200 ft AGL rope break! The PTS Area of Operation IV: Launches and Landings, Task G: Abnormal Occurrences: is the task where the examiner must test the applicants knowledge and skills on PTL events during aerotow. No specific altitude is mentioned! A good examiner will ensure that this Abnormal Occurrence does not turn into an Emergency by using good ADM/RM skills, That means picking an altitude and position where a return to the runway can be safely accomplished.

The SSF encourages instructors to raise the altitude at which they perform these in-flight abnormal occurrence training. Using 300 ft AGL creates a safety margin that allows more time for this students to evaluate the situation and react appropriately. Remember, this is training to build the skills needed to

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[7]Check out https://www.soaringtools.org/ for high resolution landscapes

handle a real emergency. There is no point in turning a training flight into a real emergency or an accident!

If you are practicing this event with your instructor during your pre-solo flights, during a Flight Review or spring checkout, or with an examiner on a flight test then a return to the airport is expected. Remember, this is training not a real emergency, so using 300 ft AGL as a minimum and revising as necessary depending on the glider's position in relation to the runway. You, and your instructor, will have a better training outcome.

It is important to realize that we want a stable approach on this return, so get any turning done as high as possible. Too many gliders are damaged, and pilots injured while attempting to turn close to the ground. This means you need to have a basic understanding of aerodynamics. What is the turn radius of the glider when it is traveling at 60 kts? How much time will it take to complete the turn at a 45° angle of bank?

Did you have your towplane drift downwind to give you the turning room making it easier to get back? If not, then you will need to do this yourself. Turn the glider to head downwind on a 45° track away from the runway centerline. After 5-6 seconds begin a 45° angle of bank turn into the wind. You will be 50-60 ft lower and almost aligned with the extended runway centerline when you complete this turn. You can now make a stabilized approach and landing with a minimal amount of maneuvering. Develop this skill using Condor or some other flight simulator before practicing it in the air.

The exact track angle and time used to create this turning room is less important than doing something to get the glider off-set from the extended runway centerline before making that course reversal turn. Using Condor you can practice multiple variations to see what works best at your field and in your glider.

In a real emergency the glider pilot may have few options. In a practice event, there must be no doubt about the outcome of the training event. Yet we see at least 2 accidents where the instructor intentionally released at a low altitude and did not make it back to a safe landing.

Every launch must begin with a pre-launch briefing about how the pilot will handle an intentional or unintentional launch abort. This does not mean just reaching a minimum altitude, but planning from the start of the ground roll to arriving at the intended release altitude.

The glider pilot must evaluate the runway condition, density altitude, wind speed and direction, towplane performance, and glider condition. Is there a strong headwind meaning a shorter take-off roll and good climb? Will the glider weather-vane or drift downwind with today's crosswind and will this change as the glider gains airspeed? Where on the runway do you expect the glider to leave the ground, what about the towplane? When can you pull the release and abort the take-off while there is still room left on the runway to stop?

What kind of off-field landing areas are there at your airport if the launch fails below your return decision point? Are you mentally prepared to land in those fields? When is it safe to turn around and land back on the runway?

One of the hazardous thoughts is Impulsivity, the need to do something immediately. The antidote is to 'think first before acting'. This is where all that pre-launch planning comes in. Recalling where you are in this evolving plan that changes as the tow progresses and executing the proper response takes time. Give yourself that time!

The only immediate action you need to take is to pitch the glider to a flight attitude that will keep it flying. On tow, the glider's pitch attitude is nose high and once the rope is gone, the glider will begin to slow down. Establishing the appropriate nose low pitch attitude is essential for a safe outcome. Next think about where you are in your plan and execute that next step.

Common errors are:

1. immediately (impulsively) entering a steep turn without setting the pitch attitude.
2. immediately (impulsively) turning while on the extended runway centerline causing a low altitude turn reversal.
3. Just considering the gliders height and ignoring the lateral position.
4. Focusing on finding the runway instead of keeping the turn coordinated.
5. Not establishing a stabilized approach once the turn has been completed.

While a proficient pilot can successfully complete a practice rope break from 200 ft AGL, assuming that the lateral position is also correct, pushing this limit has significant risk. Choosing a higher altitude during a training event to give you more time to think and execute your abort plan makes sense. A training task must never be more hazardous than a real event.

Finally, It is Area of Operation X: Emergency Operations where the applicant's knowledge of EMERGENCY procedures is evaluated. The specific tasks are (A) Simulated Off-Airport Landing and (B) Emergency Equipment and Survival Gear. Both of these tasks are evaluated in the oral portion of the practical test, not during the flight portion. Flight instructors should practice the Abnormal Occurrence of a (b) towline break at an altitude and position where the outcome of the maneuver is not in doubt.

SSF Trustee Action: Anatomy of a Kiting Accident

In August 2011 an ATP rated towplane pilot was fatally injured when the glider it was towing kited soon after takeoff. The glider released around 300 ft AGL, while the towplane stalled and crashed off the end of the runway. In October 2017 another ATP rated towplane pilot was fatally injured when the glider it was towing kited after the flight instructor became distracted in the cockpit shortly after takeoff. The glider returned safely to the airport while the towplane crashed. In March 2020 and July 2025 it happened again and again. Experienced towplane pilots were fatally injured when the glider kited shortly after takeoff. This occurred even through the towplane pilot successfully released the glider or the rope broke. Yet, the tow pilot was unable to recover before impacting the terrain.

We all understand that getting out of position during an aerotow places the towplane pilot is a potentially deadly position. Studies done by the British showed that a towplane pilot would have difficulty recovering from a kiting glider below 1500 ft AGL. That is almost the typical release altitude for most of us.

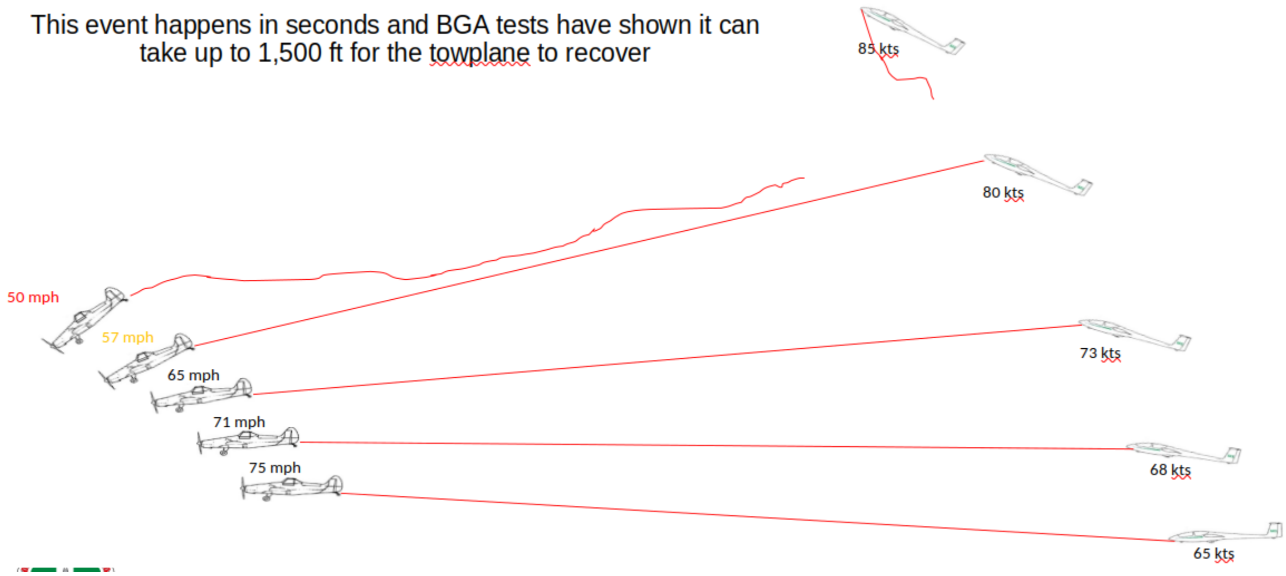

Figure 21: Glider Kiting on Tow

In a kiting incident the glider is not simply gaining altitude extremely rapidly, it is creating a large amount of drag that is impacting the towplane. As we tend to see that as the glider climbs, the towplane pilot adds increasing amounts of up elevator in an attempt to maintain the towplane's pitch attitude. As shown in Figure 21, what we fail to see is that as the glider climbs the energy it is gaining is coming directly from the towplane.

Thus, when the glider disconnects, either by the rope breaking or one or both of the pilots activating their release, the towplane is at an extremely low airspeed, possibly below stall speed, with the flight controls configured to pitch the towplane's nose up. The towplane will also have pitched nose down due to a combination of the glider pulling up on the tail and the stall caused by the low airspeed. The tow pilot is now faced with the situation where there is not enough altitude to regain flying speed that no amount of piloting skill can overcome.

The only solution to prevent this accident scenario is for the glider pilot to remain focused on a single task. Stay behind the towplane and ignore any distractions that may occur. Failure to do so has deadly consequences.

What can cause these distractions? Reports from these accidents and from incidents show that a wide variety of distractions can occur. Canopies opening in flight seem to be a leading cause in many fatal and non-fatal launch accidents. Adjusting the radio, altimeter, flight computer, or camera have all been reported as distractions. Even closing the vent window can cause a distraction. In one case the student pilot looking for traffic was enough of a distraction to make the flight instructor take over the flight controls.

Dealing with these distractions starts with a good written preflight checklist that configures the instrument, flight controls, and other items like vent windows in their proper position prior to beginning the launch. This is followed by the sterile cockpit concept used by airlines and the military. In a sterile cockpit only essential safety conversations are allowed during critical phases of flight when close to the ground. Using this concept helps glider pilots focus on the task at hand, following the towplane and reducing distractions caused by focusing attention inside the cockpit.

SSF Recommendation: Proactive Safety Programs

The traditional method for creating safety programs is to have the club or commercial operator designate someone to lead a safety committee. This committee investigates reported incidents or accidents and draws conclusions about why the event occurred. Once a probable cause has been established, the team recommends a set of steps or actions that the organization can take to prevent this type of event from occurring in the future. This type of reactive safety program has been used for decades and it has been successful in reducing the number of accidents throughout the world.

However as Human Factors errors have become the leading cause of accidents, this reactive approach is having less and less effect. This has led to the creation of proactive safety programs. In a proactive safety program all pilots, from student to flight instructor, actively look for situations or conditions that could potentially led to an incident or accident.

Consider the following example: the club recently refurbished their SGS 2-33 and replaced the fixed tailwheel with a new swivel tailwheel. Knowing that the glider will be parked alongside other gliders near the flight line between fights it is recognized that due to also having wingtip wheels, it may easily rotate in windy conditions, potentially striking a person or other glider. To prevent this from happening, the parking procedures are modified to include chocking the tailwheel to reduce the potential for this to occur and paying more attention to how the glider is parked when not in use. This demonstrates that the club thought about the potential for an incident and planned ahead to reduce the impact of this new threat.

In 2009 Tony Kern authored the book "Blue Threat – Why to Err is Inhuman"[8] which provides the reader with a guide to help themselves understand how they can develop the skills needed to detect and prevent Human Factor errors. Accepting the idea that humans will always make errors implies that there is nothing individuals can do prevent them. As shown in the example above, this is not true. We can examine our environment and personal behaviors to detect where we are likely to make mistakes. We can then modify the environment or change our behavior to reduce the likelihood of this mistake occurring.

The SSF recommends that all clubs and commercial operators implement a proactive safety program. Have all pilots search for and document potential threats or issues that could lead to incidents or accidents. A key element of this program is to document things in writing, electronic or on paper, relying on passing information verbally will lead to incomplete or compartmentalized information silos. The SSF Incident Reporting Database https://www.soaringsafety.org/forms/incident.html is one venue for recording this information.

This recommendation augments the discussions found in the **SSF Trustee Action: Safety-II Concept** section.

[8]Dr. Tony Kern USAF (ret) served as the Chair of the Air Force Human Factors steering group and was a B-1B command Pilot and Flight examiner.

SSF Recommendation: Scenario Based Training

From October 2015 to February 2016 the SSF published a series of articles in SOARING dealing with Scenario Based Training (SBT). Reprints of those articles can be found on the SSF's web site at http://www.soaringsafety.org/publications/soaring-articles.html These articles were followed by a special SBT training session during the 2016 Convention in Greenville SC. Copies of the presentation slides can also be found on the SSF's web site at http://www.soaringsafety.org/presentations/presssa.html

See a more complete set of recommendations in the SSF 2022 Annual Report. https://www.soaringsafety.org/accidentprev/SSF_2022_annual_report.pdf

SSF Recommendation: Stall Recognition Proficiency

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

See a more complete set of recommendations in the SSF 2013 Annual Report. https://www.soaringsafety.org/accidentprev/SSF_2013_annual_report.pdf

SSF Goal Orientated Approach

As the FY24 statistics show, the majority of glider/towplane 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, glider performance, 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 unacceptably low or high on the approach with very few corrective options available. The "enter the pattern over the white silo and turn base over the red barn" method is not a good teaching practice and can lead a pilot to making critical errors during the approach. Instructors need to understand the Goal Orientated Approach method and teach this method of approach to a landing to all pilots.

See a more complete set of recommendations in the SSF 2013 Annual Report. https://www.soaringsafety.org/accidentprev/SSF_2013_annual_report.pdf

Flight Instructor Roles

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

The FAA has mandated that all instructors must include judgment training and Aeronautical Decision Making and Risk Management (ADM/RM) in the flight training process. Examiners will check for this training during the practical test. The regulations require that all flight instructors provide some kind of aeronautical judgment training as well as ADM/RM training during pilot training flights (student, private, commercial, and flight instructor). 14 CFR 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 glider/towplane accident rate.

The SSF offers Flight Instructor Refresher Courses throughout the country each year. The SSF Trustees strongly recommend that ALL instructors (experienced and inexperienced alike) avail themselves of these courses to keep updated of the latest safety trends in training including ADM/RM skills and Scenario Based Training skills as well as Stick and Rudder skills. This kind of continuing education course allows for meaningful interaction between fellow CFI's and will help to keep the training we offer "standardized" throughout the country.

Important 2026 Update

In 2025, the FAA made a significant change to 14 CFR 61.57(a)(1) dealing with PIC flight with another person on board the aircraft. This change requires that a CFI MUST have (I) acted as the sole manipulator of the flight controls and (ii) completed 3 take-offs and landings in the same category and class of aircraft within the proceed 90 days to be current and act as PIC with another person in the aircraft.

Previously this rule stated these requirements held when flying with a passenger. The FAA legal department had issued several rulings stating that a student was not a passenger, so a CFI instructing a student was exempt from this regulation. With this 2025 change, those legal interpretations have been rescinded! Thus all CFI's must be 61.57(a)(1) current in the appropriate aircraft when instructing their students. Glider CFIs must have 3 take-offs and landings in a glider as sole manipulator of the controls every 90 days to be legal to have a student in the glider.

Continuing to provide instruction without being able to show proof of this currency opens the CFI up to legal action.

SSA REGIONS

Region 1-3 — Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont New York (north of 42nd parallel), Pennsylvania (west of 78th meridian).

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Region 2-4 — New Jersey, New York (south of 42nd parallel), Pennsylvania (east of 78th meridian) 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 A

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/tow-plane accidents meeting the NTSB reporting criteria are investigated by representatives of the FAA.

All aircraft accidents involving injury to passengers or crew-members 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.

<u>Definitions</u>

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

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

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

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

Serious Injury - Any injury which:

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

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

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

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

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

APPENDIX B

Phase of Operation

Ground Movement - Re-positioning of the glider while on the ground. To meet the definition of an accident, occupants must be on-board 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 aerotow, 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.

Cruise - Begins at the point where the pilot releases and ends when the pilot enters the landing pattern. Cruise flight includes straight glides, heading changes, thermalling turns, and climbing in ridge, wave, or thermals.

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 aerotow and ground launches or the pilot shuts down the engine when self-launching 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 C

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 re-positioned 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, aerotow, 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 over-stress 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.