

Launch Methods and Failures

Soaring Safety Foundation



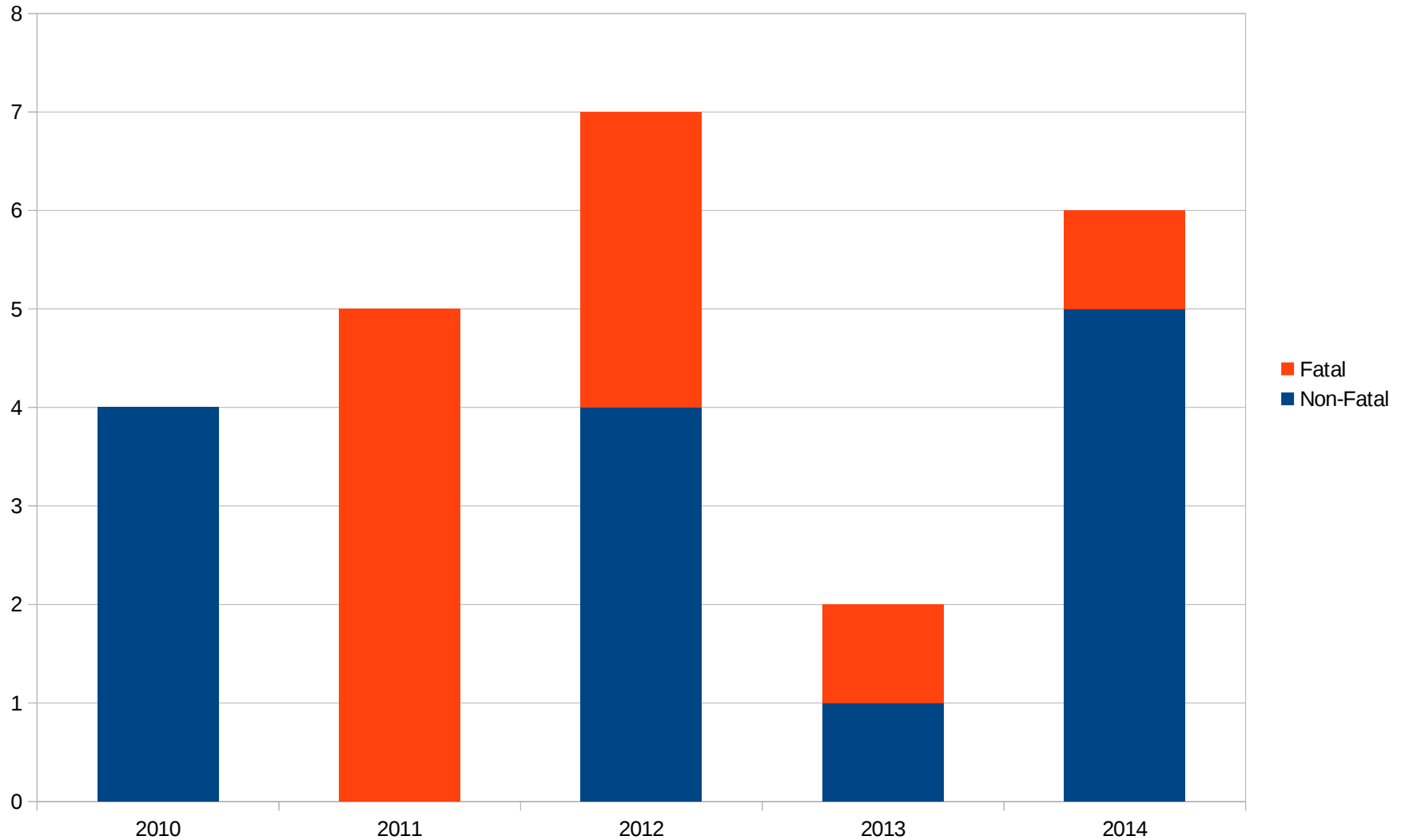
Essential Launch Personnel

- Aerotow
 - Glider Pilot
 - Towplane Pilot
- Auto/Winch
 - Glider Pilot
 - Wing Runner
 - Auto/Winch Operator
- Self-launch
 - Glider Pilot



Launch Accidents

Total Launch (PT3) Accidents



Common Distractions

- Inadvertent extension of the spoilers / dive brakes during takeoff or climb
- Improperly closed or locked canopy
- Mechanical related occurrences
- Failure of the pilot to maintain control of the aircraft
- Dealing with an unexpected event



Ground Roll Activities

- Ground signals and confirming the A/C and pilot are ready for launch
 - Communicating with the wing-runner
 - Communicating with the tow-pilot
 - Communications between Student and Instructor
 - Common errors
- Dealing with the ground roll
 - Flight controls, position and motion
 - Tow-plane and Glider flight paths
 - Training to deal with potential distractions
 - Common errors



In-Flight Activities

- Initial climb, position and relative motion
- Straight flight
 - Position and relative motion
 - Common errors
- Turning flight
 - Position and relative motion
 - Common errors
- Release
 - Clearing and pre-release tasks
 - Glider turns and positioning
 - Tow-plane turns and positioning



Aerotow Launch Emergencies

- Towrope break
 - On the ground
 - Inflight
- Inadvertent release
 - misunderstood signal from tow-plane
- Loss of power or failure of tow-plane to accelerate
- signal to release from the tow-plane



Glider Pilot Actions

- Develop a “plan of action” for each contingency/takeoff emergency.
 - Rope break
 - Inadvertent released
 - Tow-plane fails to accelerate or engine fails
- Review/Practice each response with a CFI
- Review emergency signals



Towpilot Actions

- Develop a “plan of action” for each contingency/takeoff emergency.
 - Rope break
 - Inadvertent released
 - Tow-plane fails to accelerate or engine fails
- Coordinate action plans with glider pilot
- Review emergency signals



Ground Crew Actions

- Verify with PIC that pilot glider is properly configured and ready for takeoff
- Verify with towpilot that tow-plane is properly configured and fueled
- Verify that runway and pattern clear of other traffic/obstacles
- Review emergency signals



On-Line Training

- SSF Wing Runners Course
 - <http://www.soaringsafety.org/school/wingrunner/toc.htm>
 - Ground Handling,
 - Assisting the Pilot with Pre-Flight Preparations,
 - Positioning the Glider for Takeoff,
 - Assisting the Pilot with Pre-Takeoff Checklist,
 - Connecting the Towline,
 - Launching the Glider,
 - Final Exam



On-Line Training

SSF Tow Pilot Training Course

- Course Introduction
- Tow Hook, Tow Ring, Tow Rope Inspection,
- Takeoff Planning,
- Standard American Soaring Signals - Ground Signals,
- Take Off and Climb,
- Tow Positions, Turns and Release,
- Descent, Approach, and Landing,
- Cross-Country Aerotow,
- Emergencies,
- Other Airborne Non-Emergency Signals,
- Federal Aviation Regulations for Two Pilots,
- Flight Training Syllabus,
- Final Examination.



Recommendations

- Effective Use of Checklist
- Takeoff Emergency Planning
 - Review “plan of action” prior to takeoff
 - Coordinate with Wing Runner
 - Coordinate with Tow Pilot
- Proper Use of SSA Recommended Signals
- Effective Use of Resources



Launch Scenarios

- Self-launch departure procedures
- Aerotow low-altitude release
- Winch low-altitude cable break
- Runway incursion after tow starts
- Intentional rope break in windy conditions
- Stall/Spin following low-altitude rope break
- Mid-altitude release decisions
- Off-airport landing during launch



Self-launch Departure Procedures

Ingrid has taken the old Scheibe SF-25 TMG over to a nearby local airport for lunch with her friends. As Ingrid takes the active, she is forced to wait while the departing Cessna 150 clears the extended runway centerline. Ingrid finally begins her take-off roll when she hears an exasperated voice on the radio saying that his Citation is 3 miles out on final and would the departing traffic quickly clear the area. At 100 ft AGL Ingrid rolls the glider into a steep left turn to comply with the Citation pilots request.



Self-launch Departure Procedures

- Pilot
- Aircraft
- enVironment
- External



Aerotow Low-altitude Release

Ingrid, a high time commercial pilot, is working for the local flight school giving rides in the SGS 2-32. The school's Pawnee is down for maintenance so the old reliable Citabria is being used on this hot and humid afternoon. Despite a pre-launch passenger briefing, the young couple manage to pull the rear release as the tow-plane is climbing through 200 ft AGL. Ignoring the temptation to turn around, Ingrid makes a shallow left turn and lines up with an open field about 1/2 miles off the departure end of the runway.



Aerotow Low-altitude Release

- Pilot
- Aircraft
- enVironment
- External



Low-altitude Winch cable Break

Irving is a high time private pilot who is known for bragging about always getting the highest winch launch no matter what the conditions. Today there are gusty winds about 10 degs off the runway heading as Irving and his Phoebus C are connected to the winch cable. Irving pulls the Phoebus into the air and is already approaching a 45 deg nose high flight attitude at 150 ft AGL when a gust induced load caused the weak link to break. The glider rolls right and pitches nose down as it stalls and enters a spin.



Low-altitude Winch cable Break

- Pilot
- Aircraft
- enVironment
- External



Runway Incursion after Aero-tow Starts

Ingrid is acting as the sniffer pilot during the regional contest at a local public use airport. The glider and tow-plane are communicating on 123.3, while the other airport users are on the published CTAF frequency. As Sam the tow-pilot begins the launch on the grass runway 4, out of view behind a stand of trees, an AA-1 Yankee begins his take-off role on the intersecting hard surface runway 30. Sam and Ingrid struggle to avoid each other and the Yankee as they abort their launch.



Runway Incursion after Aero-tow Starts

- Pilot
- Aircraft
- enVironment
- External

Intentional Rope Break in Windy Conditions

Ingrid, an experienced CFGP, has spent the past few weekends giving spring check-outs to club members. Sam, the latest pilot has flown in these conditions before and Ingrid will have no qualms about soloing him, provided his performance today is up to par. Ingrid notes that Sam, like a lot of the other pilots, failed to do a pre-launch briefing on launch failures, so she decides to 'teach him a lesson' by giving him a 300 ft rope break. She is forced to take over the flight controls when Sam fails to respond properly after she pulls the release.



Intentional Rope Break in Windy Conditions

- Pilot
- Aircraft
- enVironment
- External



Stall/Spin Following Low-altitude Rope Break

Ingrid is making her 1st flight in a recently purchased ASW 20. The plan is to make a high tow off the 4000 ft runway behind a 260 HP Pawnee on a calm/cool morning. The tow-plane begins climbing quite rapidly and Ingrid is having trouble maintaining tow position so she releases and immediately begins a steep right turn to make a downwind landing. Halfway through the turn the nose begins to fall and the right wing drops as the glider begins yawing to the right.



Stall/Spin Following Low-altitude Rope Break

- Pilot
- Aircraft
- enVironment
- External



Mid-altitude Release Decisions

Irving is a medium time private glider pilot making a routine flight in the club's L-33 solo. There was a lot of activity on the flight line and Irving felt a little rushed, but he is settling down now that they are approaching 500 ft AGL. As they start a left turn the glider reacts to a strong gust and Irving hears a loud bang. He immediately pulls the release and slams the stick to the right to clear the rope.



Mid-altitude Release Decisions

- Pilot
- Aircraft
- enVironment
- External



Off-Airport Landing During Failed Launch

Irving is visiting a new soaring site and has been invited to take a flight in the club's DG-1000 with Ingrid, the club's chief instructor. Before launch Irving has asked Ingrid what is behind the trees off the end of the runway. She replied that there are landable fields 30 deg's to the right, but the field straight ahead is unsuitable. At 100 ft AGL over the trees, Irving notices a puff of smoke coming from the tow-plane and sees the tow-rope fall away a second later. He pitches the nose of the glider down and makes a coordinated right turn to line up with the field visible 1/4 miles in front of him.



Off-Airport Landing During Failed Launch

- Pilot
- Aircraft
- enVironment
- External

