Soaring Safety Foundation

Abnormal Occurrence Training
by Richard Carlson – SSF Chairman

This is the 4th article in our launch failure series. To quickly recap: The 1st article described the problem where over the past 15 years 40% of the launch failure accidents resulted in fatal injuries to the pilot. The 2nd article described multiple ways that an aerotow launch could fail, with few of them being the traditional 'rope break'. The 3rd article discussed why simply using 200 ft AGL as the sole decision criteria was not an adequate method for developing your emergency plan. This article discusses why a plan is required and how to begin train pilots to deal with these Premature Termination of the Launch (PTL) events.

As you may expect, the reason we teach PTL procedures is because we are required to. 14 CFR 61.87(i)(19), 61.107(b)(6)(x), 61.127(b)(6)(x), and 61.311(k) for student, private, commercial, and sport pilots respectively require training in Emergency Operations. Student pilots are specifically required to be trained in towline break procedures.

For you to earn a Sport, Private, or Commercial pilot certificate, the DPE conducting a practical test, or Instructor performing a sport pilot proficiency check, uses the tasks in the appropriate Practical Test Standard (PTS) document. For example the Private Pilot Glider PTS states for aerotow launches:

G Task: Abnormal Occurrences.
Objective: to determine that the applicant:

1. *Exhibits knowledge of the elements related to aero tow abnormal occurrences, for various situations, such as -*
   a. *towplane power loss during takeoff.*
   b. *Towline break.*
   c. *Towplane power failure at altitude.*
   d. *Glider release failure.*
   e. *Glider and towplane release failure (oral only).*
2. *Demonstrated simulated aero tow abnormal occurrences as required by the examiner.*

There are similar tasks for self launch and ground (winch) launch activities. In addition to this specific task, the examiner is required to evaluate the pilot on 15 special emphasis areas, described in https://www.faasafety.gov/files/events/WP/WP19/2017/WP1974665/WP1974665F.pdf This brings an element of Risk Management into the examination.

Sometime in the future the FAA will update the glider PTS's to Airman Certification Standard (ACS) documents. The major difference is that while each PTS task has Knowledge and Skill elements, each ACS task has Knowledge, Risk, and Skill elements. In a hypothetical private pilot glider ACS the knowledge elements could add things like: terrain and obstacles around the gliderport, alternate safe landing areas, and weather issues to the existing list. The risk elements could include things like: stall/spin awareness, weather (wind, density altitude, etc), lack of situational awareness, and impulsive behavior. The skills element would not change, requiring the pilot demonstrate one of the abnormal occurrences listed above.

For decades, we have focused our attention solely on item b. Towline break in that PTS list of abnormal occurrences. That has been the traditional 200 ft AGL rope break. The pilot is then expected to execute a return to the runway.

As every instructor knows, one challenge is to train students correctly the first time. It is much harder to retrain someone after they have developed bad habits. This is know as the Law of Primacy. The question is, what is the primary lesson this rope break training seems to have taught us?

Turn around and land back on the runway!

In order to reduce the fatal accident rate, we need a better set of pilot skills. That means creating better training activities.

A good place to start is outside the glider with a discussion on what you want to achieve. The goal should be to safely land the glider without injury to the pilot and/or people in or near the glider. That may include developing a list of reasons that a return to the runway is not the best option. A sample list could be:

- Several safe alternate landing areas.
- Horizontal and vertical position that doesn't allow a safe return.
- Wind speed/direction that creates a hazardous downwind landing.
- Lack of Pilot proficiency in this maneuver.

An alternate list of when it is best to return could include:

- Height and position allows for a partial pattern to be flown.
- Lack of safe alternate landing areas.
- Convenience.
- We've always done it that way.

If the last 2 items are part of the decision making process, then it's time to think again. Are those just remnants of their student training and the Law of Primacy?

Next have a discussion of the risks and mitigation strategies. What is an impulsive behavior and what is the antidote for that behavior (Thought: Do something NOW, Antidote: Slow down, think first)? To get some idea of the risks view the SSF's Flight Safety videos specifically the Stall/Spin Base to Final and Premature Termination of the Tow (PT3) videos. These show how skidding turns or impulsive behavior can lead to a stall/spin accident. Finally consider a better way to train students and pilots.

A better way to train is after developing and reviewing these lists, use a tool like Condor to develop the skills needed to NOT return to the runway. As an instructor you can train your students and pilots to deal with launch failures at multiple altitudes under different weather conditions, and in many different abnormal situations. The point is to get them used to landing in one or more of the alternate landing areas near your gliderport. A landing back on the runway should be done only if that is the best option.

The specific skills to focus on first are those related to a PTL just before or after the glider becomes airborne. The pilot should land straight ahead and maneuver to the right if necessary and runway conditions permit. Then add training where the PTL occurs just as the towplane passes the end of the runway. The goal is to execute the options that are available at your gliderport.

You can also program the Condor towplane to wave you off at various altitudes during the tow. This will build up the pilots skills in recognizing a failing towplane and dealing with the wing rocking signal. Start with PTLs above 500 ft AGL. The goal is to then get the glider established on a stable final

approach to either the runway or a field. Properly done, student will recognize if a return to the runway is the best option or can easily make a field landing.

Once this training has created a solid base, that returning to the runway is not always the 1st or even best option, in-flight scenarios can be considered.

After this a good plan is to speak with the tow pilot and have them simulate a failure at a safe altitude. Have them reduce the power by a couple hundred RPM. Give the student a few seconds to recognize the failure, as described in Wander's article last December. If the student doesn't react, a wing rock will force a release. Depending on the amount of Condor practice this simulation could be anywhere between 500 and 1500 ft AGL. It is essential that the tow pilot put you in a position where a safe landing can be easily made.

More than likely, these in-flight simulations will result in a landing back on the runway. The post-flight briefing should include a discussion on why that was a good decision and what risk factors would have led to a safe landing in an alternate field. The major point is to emphasize that getting the glider established on a stable final is key to making this safe landing. Note that none of this practice is done using the traditional 200 ft rope break.

Next month we will conclude this PTL series with a focus on how to safely conduct that 300 ft AGL rope break.