OAS-43A
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Interagency Aviation Accident Prevention Bulletin

Subject: Airplane Flight

Area of Concern: Flight Safety

Distribution: All Aviation Activities

Discussion: Unstable Approach

A study conducted by Airbus on go-arounds pointed out that only three percent of commercial pilots comply with SOPs that mandate a go-around if the aircraft is not on a stabilized approach at or below 1000 feet AGL. It also referenced that corporate pilots are believed to do the same.

Captain Bill Curtis, from the Flight Safety Forum, provided further analysis from the study: "In other words, ninety-seven percent of those pilots continued with a bad approach. Eighty-three percent of those [approach and landing] accidents could have been prevented with a go-around. Fifty-four percent of all transport-category accidents in 2011 could have been prevented if the crew had decided to try again. The question remains: why do accidents related to a failure to execute a go-around continue to happen?"[1]

These are remarkable statistics given that landing is the most common phase of flight when an accident ocurrs within general aviation (Figure 1 on page 2). Historically, within DOI and USFS, single engine operations in the landing phase is the most common phase of flight associated with an accident (Figure 2).

[1] Safety Forum: Too Few Go-arounds Executed. Retrieved from http://www.ainonline.com/aviation-news/aviation-international-news/2013-08-03/safety-forum-too-few-go-arounds-executed.

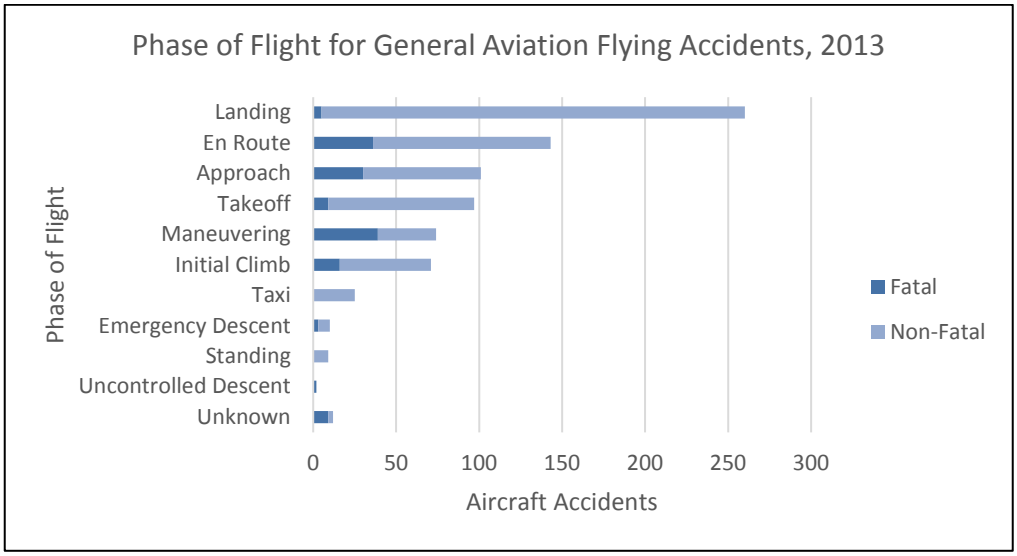

Figure 1. NTSB Phase of Flight - General Aviation[2]

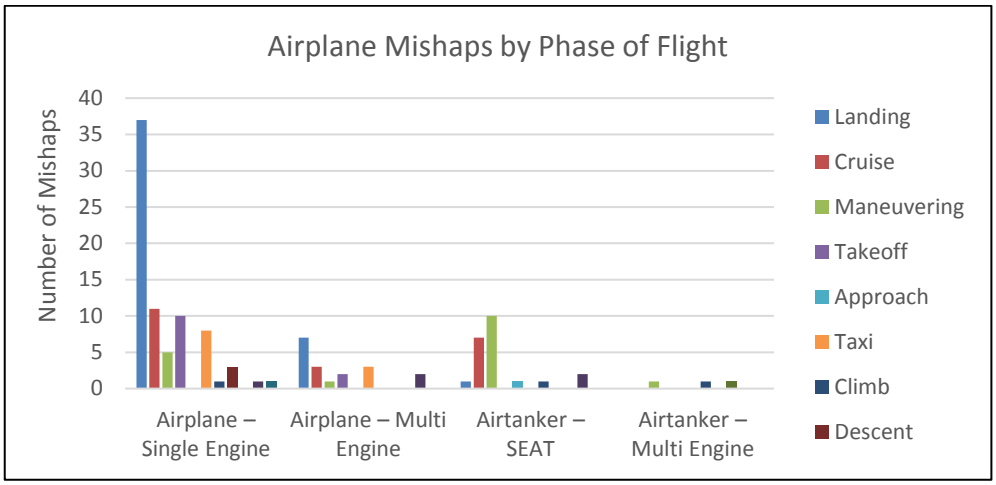

Figure 2. Phase of flight data from the Interagency Accident Database from 1997-2016

Not all landing phase mishaps can be directly attributed to unstable approaches, however, failing to recognize conditions that would require and initiating a go-around is a major contributing factor in landing accidents.

The flight profiles that represent the most common landing mishaps include contact with terrain/water, loss of control, and gear up (Figure 3). These types of landing mishaps may have been avoided if a go-around was executed, especially in the series of loss of control or gear up landings involving a distraction or disruption in the landing phase.

[2] NTSB's Summary of US Civil Aviation Accidents for Calendar Year (CY) 2013. Retrieved from: http://www.ntsb.gov/investigations/data/Pages/AviationDataStats.aspx

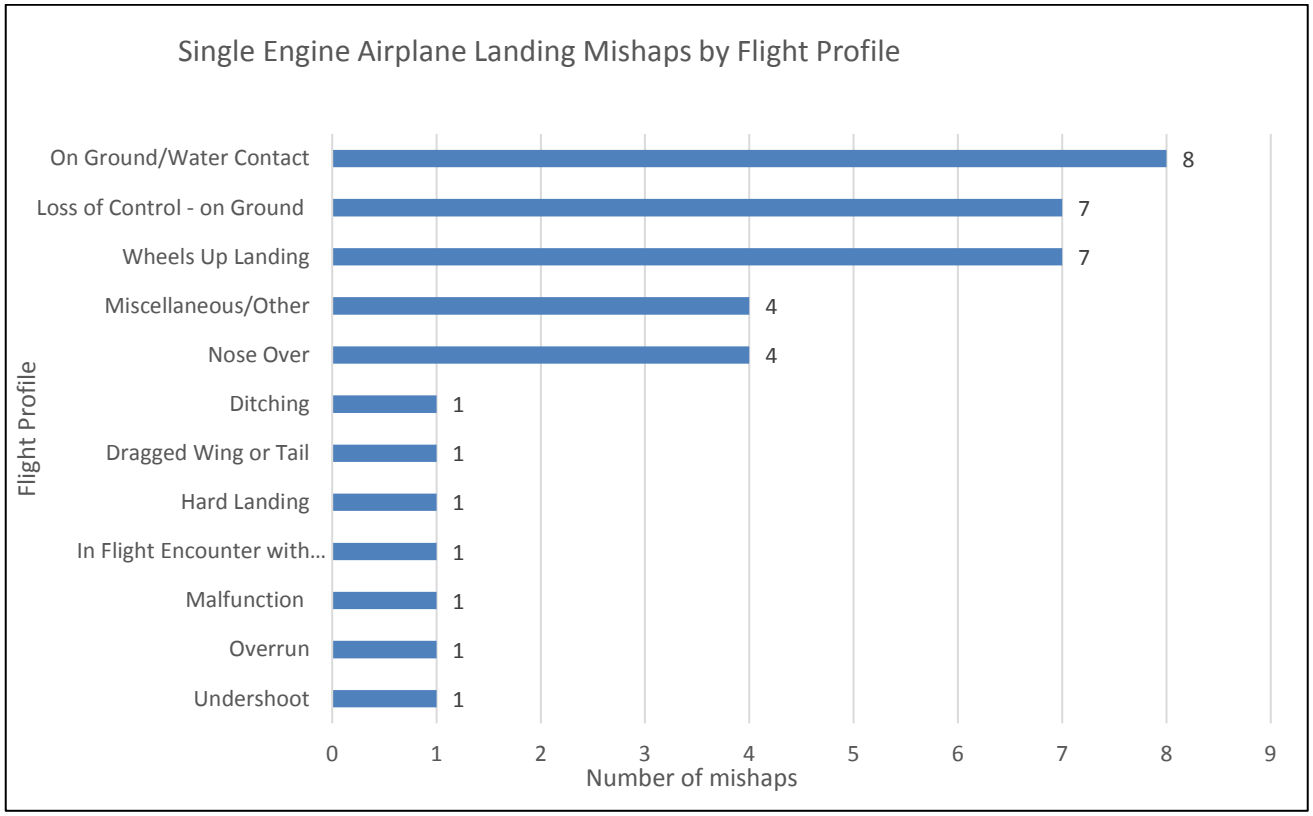

Figure 3. 37 Single engine airplane landing mishaps by flight profile, Interagency Accident Database from 1997-2016

The FAA (among many organizations) promotes the stabilized approach concept and strongly recommends it for all aircraft opertions including propeller-driven airplanes and helicopters. The stabilized approach requires the pilot to establish and maintain a constant glidepath to a predetermined point on a runway while maintaining descent airspeed, power, and configuration. Small corrections can be made to adjust for any deviations in the plan such as wind, obstacles, or wildlife. Pilots should limit the configuration changes in low altitude to minimize workload. The stabilized approach concept reduces many of the variables in the landing phase. Pilots can set the configuration early so that landing checks and other things that might be missed when rushed are completed.

Elements of the stabilized approach concept to determine prior to the approach:

- Flight path: angle and desired heading.
- Airspeed
- Vertical speed
- Configuration
- Power setting
- Landing checklist complete and crew ready

When the approach is organized in this manner, the pilot is afforded more opportunity to focus more towards outside references. If the approach becomes unstable (excessive speed, wind, traffic, caution lights, wildlife, etc.), the pilot has more time and less workload to adjust and monitor. The pilot can devote more of their attention outside the cockpit rather than inside, especially at a critical low altitude, adverse weather, night, or all of them combined. The key is to lower the workload which in turn will provide the ability to focus more on the critical elements during the final moments.

Unimproved or "backcountry" landings do not always afford conventional patterns, but maintaining the stabilized approach concept is beneficial. By pre-establishing the landing parameters using the stabilized approach concept, pilots are better able to identify when a go-around should be initiated. For example, a pilot would set a limit ahead of time for the altitude or point where he/she might roll into final, such as 500 feet above the ground on a visual approach. If pre-established thresholds in terms of airspeed and sink rate are not maintained throughout the approach, then a go-around should be initiated.

The go-around is not an emergency procedure, but it is a normal procedure that might be used in an emergency. If they are not part of a pilot's regular routine and habit, the skills and the mental elements to use the go-around will deteriorate. Pilots should practice this skill as they would any other flight skill and not attempt to salvage approaches that are outside the pre-established profile that might lead to (dire) unintended consequences. One valuable technique includes planning for a go-around during every approach in order to reduce the "surprise" element that often inhibits pilots from performing it well.

The stabilized approach is not a new idea or concept, but another proven method to always stay ahead of the airplane. Even the most experienced pilots can find themselves getting behind. Having a more systematic method will help us reverse the landing phase accident trend.

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