Safer Approaches & Preventing CFIT Accidents
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This email is dedicated to yet another pilot who has lost his life in a CFIT accident. It is being sent to you to spread the safety message.

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Darren

Fundamentals of a Safe Instrument Approach

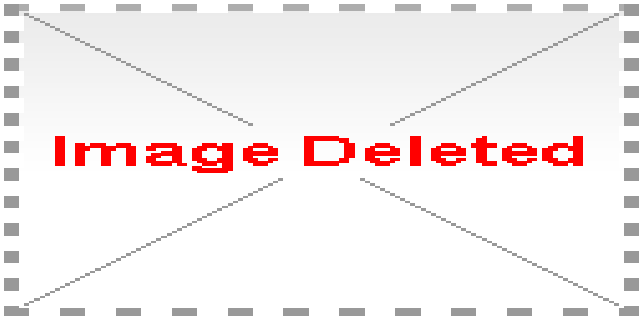
A frequent reader of my website wrote to me asking what are the common things that can kill on you an instrument approach. It was a great question and I didn't have an immediate answer, just a few thoughts that I provided to him over a few emails back & forth. To provide a more complete and thoughtful answer would require some research. After reviewing 87 approaches that led to a fatal accident, I found a common pattern among all of them. Each of the fatal accident flights violated one or more of what I call the Four Fundamentals of a Safe Approach. Some of these are so basic to IFR flight, it's a shame that the hopes and dreams, the very essence of the lives of these pilots and passengers were snuffed out of existence in a few terror filled moments. This article doesn't review those 87 accident flights, but the fundamentals of what keeps us safe on the approach and ensures we arrive alive.

1. Understanding environmental conditions. A number of the accident flights studied found pilots flying into environmental conditions known to be dangerous. Two primary environmental conditions appeared repeatedly: wind shear and icing. While low level wind shear was not necessarily an IFR concern, coming out of the bottom of a cloud deck and not understanding what the wind is doing is a killer. Several of these could be chalked up to not understanding the wind direction upon landing, flipping, and then fatalities from impact trauma or post crash fires.

The far more common environmental condition that led to fatalities was flight into known icing. If your aircraft is not equipped, your horizontal stabilizer, wings, props, and windshield could be covered in ice and lead to deadly aerodynamic effects. Good preflight planning as well as a good "Plan B" will help you to avoid flight into known icing.

2. Controlled Flight Into Terrain. More than a few of the reviewed accident flights ended in disaster from flying a sound aircraft into the ground. I've written on my website before that CFIT is 5 times more likely during non precision approaches. Two ways you can prevent this from happening to you are: altitude briefing and situational awareness.

Consider the approach profile to the right. Two critical things must happen: an approach briefing and call-outs on the approach. First, the approach briefing must include the starting and ending altitudes. In this case, we'll start at or above 1700 MSL and continue to 336 MSL on the glideslope then land or go missed approach. The altitude at the Final Approach Fix (FAF) should be briefed as well. If you arrive at the FAF and your altitude is not 1513MSL, there's a problem and should result in a missed approach. This must be verbalized during your pre-briefing of the approach.

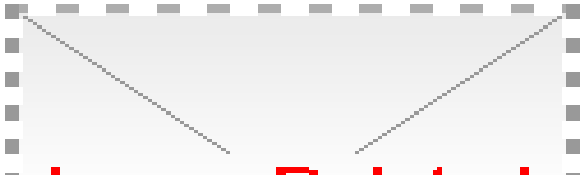


Second, while you are conducting the approach you should make call-outs, even if you're alone. At the FAF, you should call out the name and the "last chance altitude". I call this the "last chance altitude" because its your last chance to check your altimeter with a known-good reference before you enter the final segment and descend for the approach. In this case, your call out should be: *"WIREY, 1513"* and check the altimeter to ensure it reads 1513 +/- 75 feet (per FAR 91.121).

3. Situational awareness. Two of my favorite questions I ask students, *"Where are you and what comes next."* The purpose of these two questions is not to torment otherwise hard working students. It is meant to teach the habit of a mental exercise whenever a pilot is flying during a critical phase of flight. Especially during an approach. One of the best ways to ensure you'll maintain your situational awareness on an approach is to perform an approach briefing. Briefings should include:

- Airport Name/City
- Primary Nav Aid & Inbound Course
- Runway & TDZE, Approach Lighting, Alternate Minima
- Approach Notes
- Missed Approach
- Frequencies
- General Direction inbound
- Additional Nav Aids used
- Largest Obstacles along approach path
- Minimum Safe Altitude
- Final Approach Course, distances, altitudes, including "last chance altitude"
- Minima including alternatives if the approach briefed cannot be completed
- Timing, if present
- Airport diagram

4. Stabilized Approaches are an absolute must. By



far, the most common problem found during reviewing the 87 accident flights was the lack of a stabilized approach. The stabilized approach is a time tested, airline proven safety technique to execute an approach. A stabilized approach is defined as a power setting, descent angle, descent rate, and pitch that stays relatively fixed (stable) during the final segment. This usually means a descent rate of less than 1000 feet per minute while flying a fixed ground speed determined by the characteristics of the airplane flown. For the typical C172, this means a descent of 500 FPM, a power setting of 1700RPM and an approach ground speed of 90 knots. Your settings will vary based on density altitude and airplane characteristics. For a precision approach, the glideslope usually keeps us honest because there is instant feedback should we not maintain the appropriate descent angle. For a non-precision approach, the Constant Angle Non-Precision Approach (CANPA) is the proper technique to achieve the stabilized approach. To illustrate the difference, I flew an approach in a 737 simulator that has a graphing capability so that you can see the difference between a stabilized and unstabilized approach. In the unstabilized approach, descent rates varied from 2000 FPM down to 1000 FPM up. This is typical of the performance of pilots I've seen for Instrument Proficiency Checks. These pilots expend quite a bit of brain power chasing a wild descent down the glideslope.

The stabilized approach descent rate was about 750 FPM throughout the final segment. You can see that the stabilized approach profile is not perfect -- I think only a very expensive autopilot could give you a perfect descent. But what you can see is the stabilized descent goes a long way to minimize aerodynamic surprises, CFIT, and you'll exert less brain power.

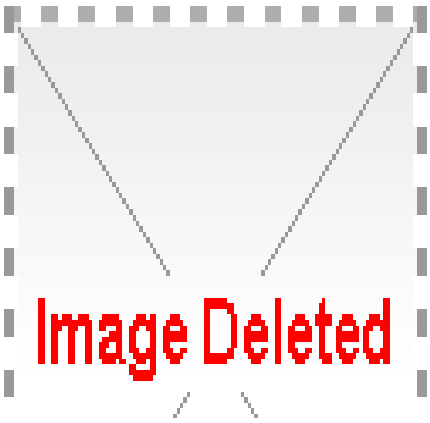
...read more about Non-Precision CFIT and Stabilized Approaches

Get the simple tool which can prevent CFIT Accidents

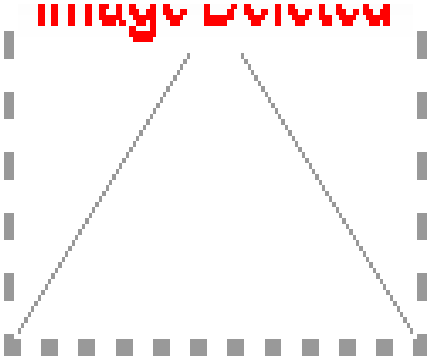
Use the safest, airline-proven flying technique for non-precision approaches that minimizes aerodynamic surprises and virtually eliminates the possibility of Controlled Flight Into Terrain.

Safer Approaches will teach you how to conduct Instrument Approach Procedures to a higher standard of safety and precision. You will learn:

- Four Fundamentals of Safe Approaches,
- How to virtually eliminate possibility of CFIT of Controlled Flight Into Terrain,
- How to perform a Constant Angle Non-Precision Approach (CANPA),



- How to calculate a Visual Descent Point (VDP),
- How to practice building your flying precision.



What's in the Package?

1. The Safer Approaches Booklet - a tutorial on performaing safer, stabilized approaches. 14pp.

2. Stabilized Approach Descent Rate Table, a kneeboard sized 4" x 6" plastic, IFR tool that eliminates the mental math applying these techniques during your IFR flying.

Price: $7.95 (free shipping to US addresses)

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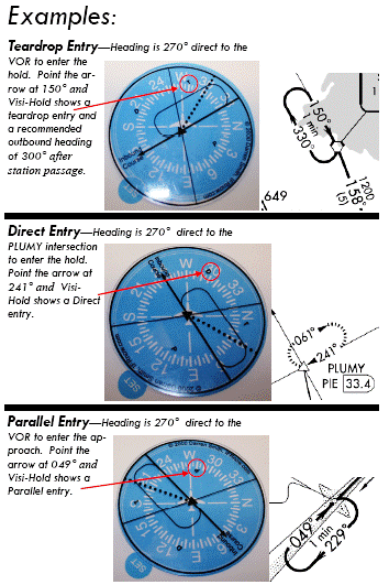

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In Memory Of... An Aviation Legend

WICHITA, Kan. (AP) - A 93-year-old woman who was fixture in Kansas' aviation community has died. The Wichita Eagle reported that Marguerite Lawrence died this past week.

Until her 90th birthday, she volunteered at the Experimental Aircraft Association's annual AirVenture Oshkosh. After selling tickets by day, she would camp in a pup tent. Her son, Stan Lawrence, says she refused to stay in a hotel.

Marguerite Lawrence also was a longtime volunteer at the Kansas Aviation Museum and was involved with other aviation groups.

She was 21 when she soloed and earned her pilot's certificate three years later.

Her flight instructor, Gene, became her husband, and she helped him with the fixed-based operation he ran in southern Nebraska.