Glider Accidents – Statistics & Prevention

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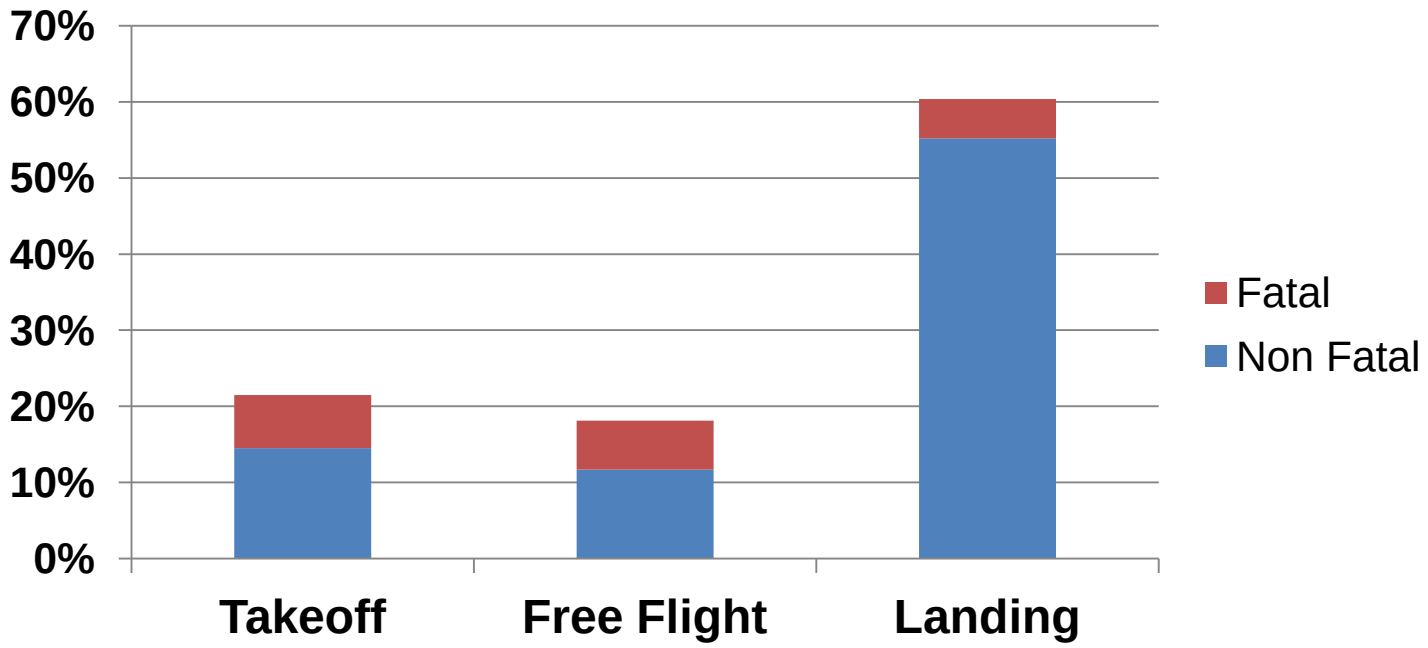
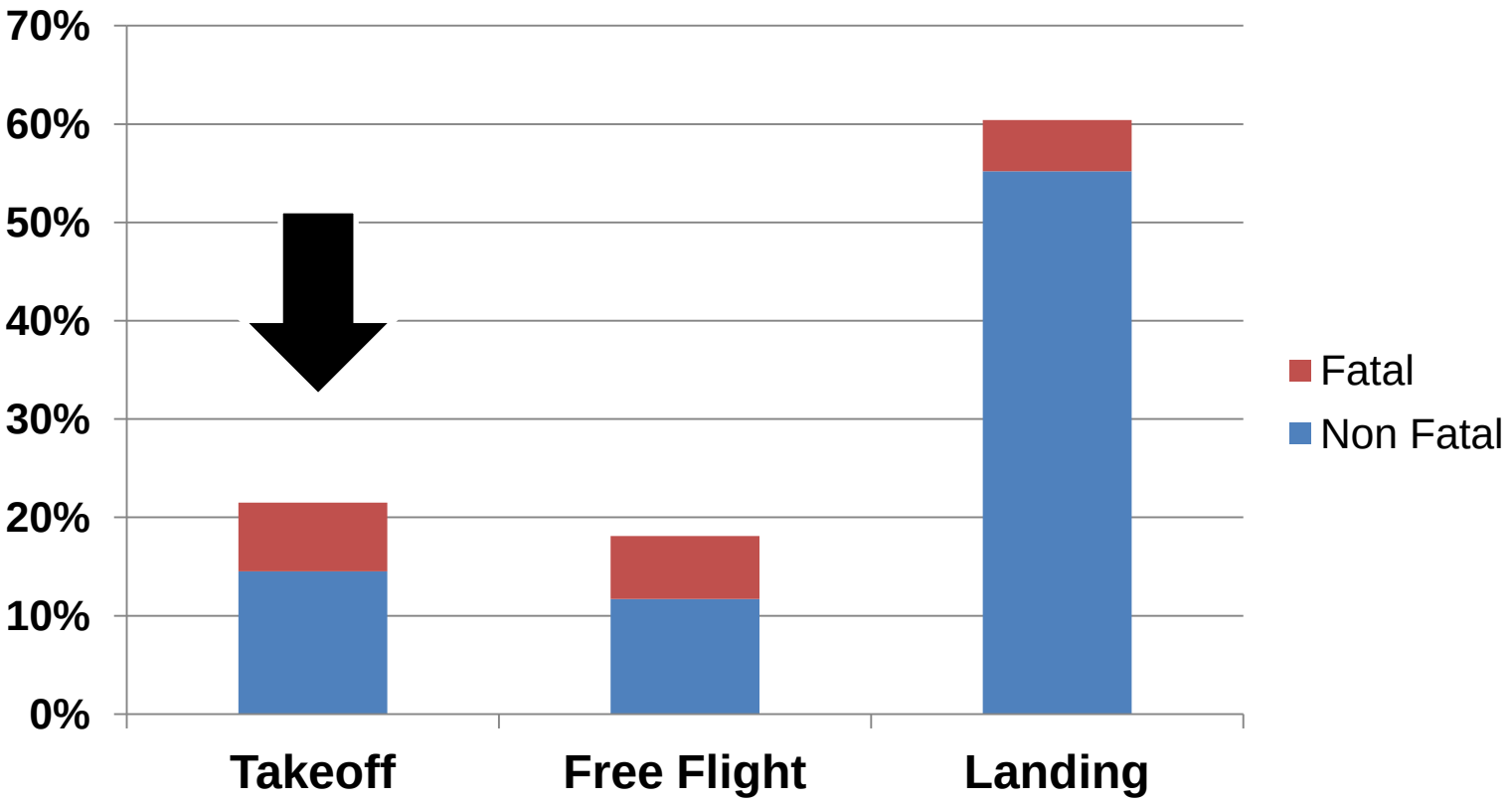
Glider Accident Summary

- Data from 2008 – 2013
- 172 accidents reported to NTSB
- SSF categorized into three Types



What fact is painfully obvious?

Takeoff



Approximately 20% of all accidents occur during the takeoff phase

{ Video clip of canopy coming open on Takeoff }

According to the SSF opening canopies and deploying spoilers are more likely to cause a takeoff accident than a rope break or any other type PT3 event. (PT3 = Premature Termination of the Tow)

Canopy and spoiler accidents are preventable! They occur because the pilot failed to properly complete their Pre-Takeoff checklist.

Low altitude emergency training tends to focus on rope breaks. In reality rope breaks are a small fraction of Takeoff accidents.

Deployed Spoilers

There is no reason that deployed spoilers should cause an accident.

Just close them!

Rudder Waggle --- A potentially dangerous signal

- Two Landmark accidents; same scenario (2006 NV, 2011 MD)
- Pilots reacted too quickly w/o thinking and pulled release. (Panic? Misinterpretation?)
- Had insufficient altitude to return to airport. (120', 200')
- ASG Tow Pilot Manual discourages this signal below 1000' AGL; Rudder deflections and AD coupling.

Opening Canopy

There is no reason that an opening canopy should cause an accident!

Effects of an Opening Canopy – On the Glider

- Canopy is “on axis” with the fuselage.
- No adverse Yaw, Pitch, or Roll
- Slight increase in drag; reduction in L/D
- Like flying with partial spoilers
- **Glider flies just fine**

Opening Canopy

Effects of an Opening Canopy – On the Pilot

- Happens suddenly; “fright factor”
- Face full of wind; Ears full of loud noise
- Psychological impact
- Something scary; never experienced before

THE REAL DANGER IS NOT THE REACTION OF THE GLIDER BUT RATHER THE REACTION OF THE PILOT!

Opening Canopy

On Takeoff

Be aware of whether you can land (and stop) on the remaining runway, or, if you should you “hang on” till reaching a higher altitude.

On Landing

At some point you will realize that you must release the canopy to actuate the spoilers.

DO SO! “Aviate” still comes first.

Don’t turn an embarrassment into an accident.

PT3 Emergency Response

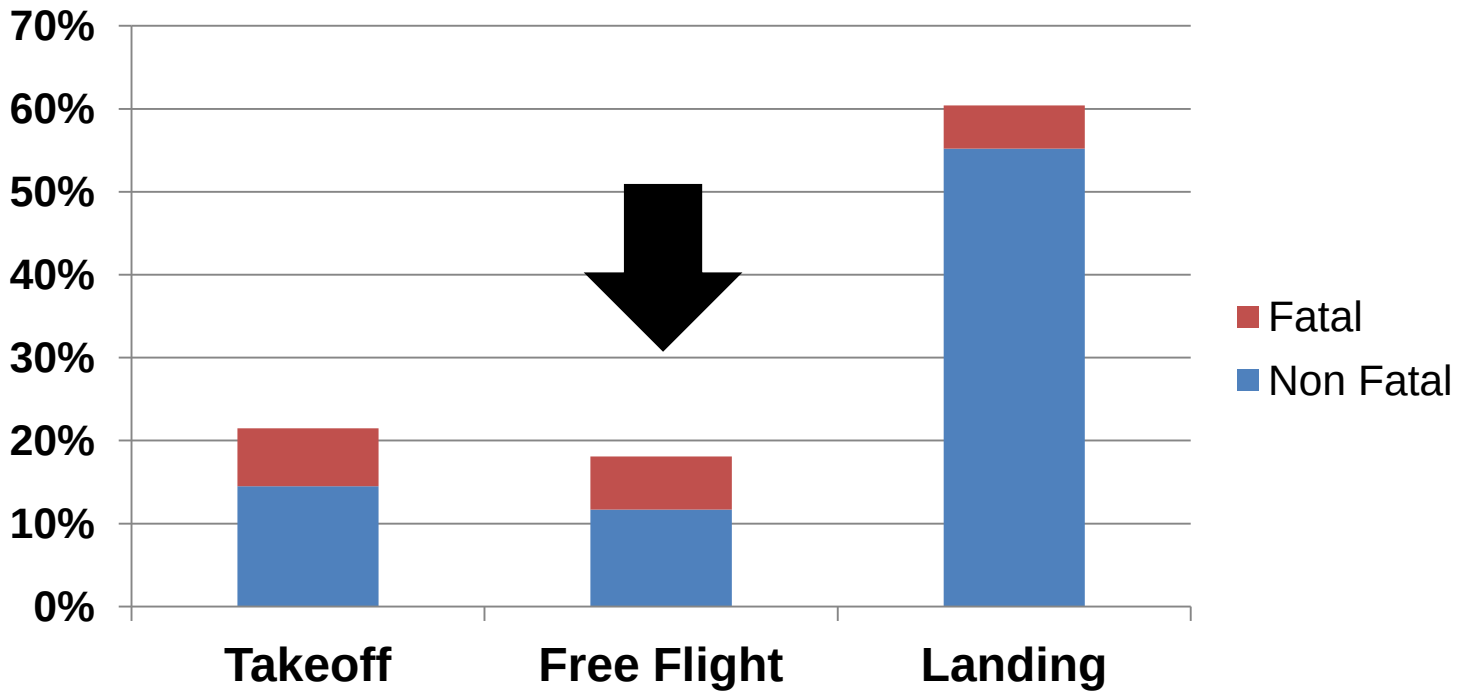
While under tow you are a powered aircraft.
You can fly with your nose above the horizon.

When you loose your connection to the tow plane, you cease to be powered aircraft and become a glider; and you need to act like one.
You are immediately in an unsustainable attitude and losing airspeed.

You need to lower your nose -- QUICKLY !!

John! Why are you telling us this?

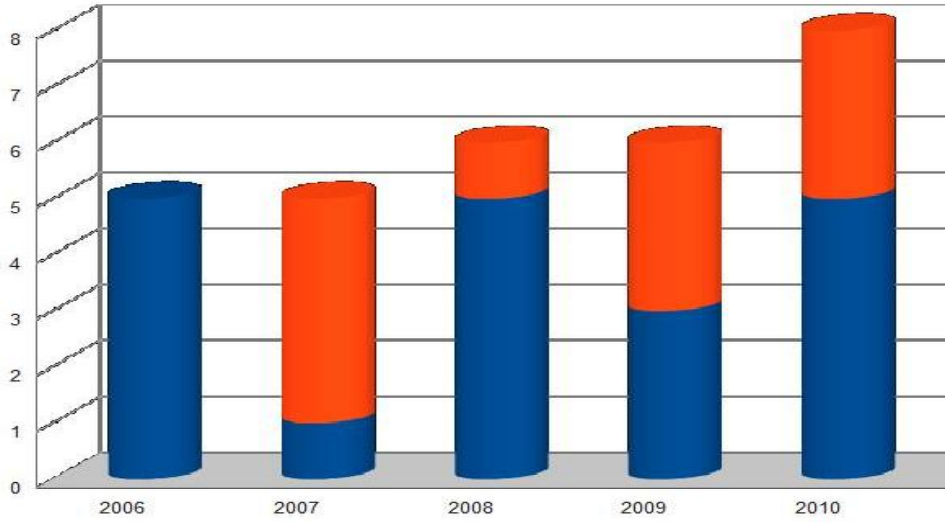
Free Flight



About 20% of all accidents occur during the free-flight phase

In 2006-2010 there were a total of 30 free-flight accidents in the US

12 were fatal



- 7 were mid-air collisions
- 23 were crashes into terrain

A majority of mid-air collisions occur:

- *Below 3,000 AGL*
- *During good weather*
- *On weekends*
- *Within 10 miles of a non-tower airport*

Once you leave the gliderport/training environment, the major safety threat is crashing into terrain.

Many free flight accidents appear to be the result of a Stall-Spin at low altitude with insufficient height to recover.

Free Flight Accidents Near the Ground

The environment down low is different than at 2,000 feet and above.

Atmospheric Differences

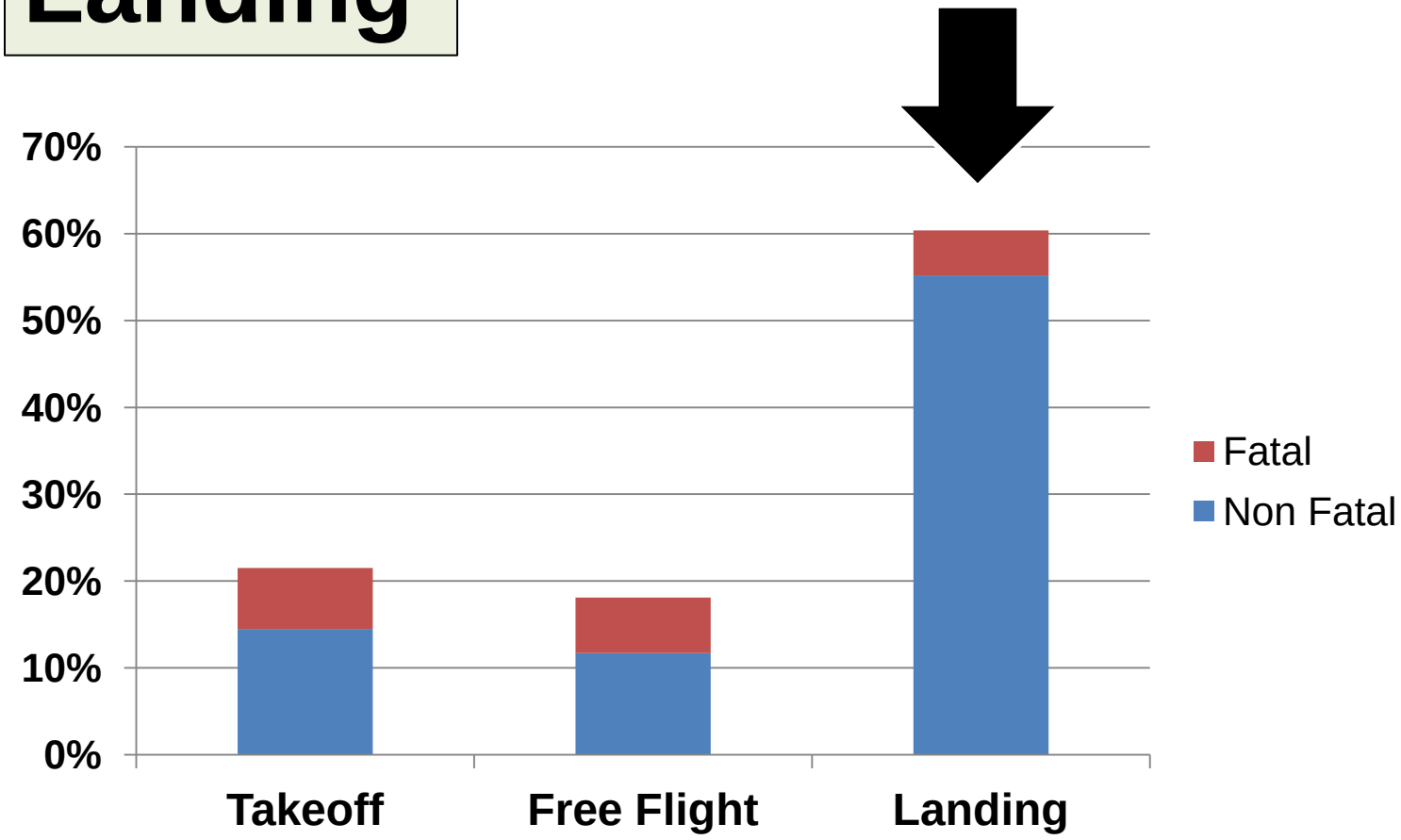
- More turbulent because of smaller thermals or Dust Devils
- More turbulent due to obstruction induced wind turbulence
- Horizontal wind shear gradient due to ground resistance.

Sight Picture

Relative ground motion is hard to ignore

Just because you've never unintentionally spun at altitude does not mean that your "spin resistance" is the same at 300 feet.

Landing



More than half of all accidents occur during the landing phase. This has been true for decades.

Yes!

“Landing Accidents” include Landouts.

Landing Accident Scenarios

Land Short accidents result in more damaged and destroyed gliders than any other type of accident.

- Do not typically result in serious injury to the pilots.
- Most commonly occur on local flights as the pilot is returning to their departure airport.
- Majority of these accidents occur after the pilot has flown a normal traffic pattern until impact short of the runway on a straight-in or abbreviated final approach segment.

The second most common type of landing accident is a collision with obstructions on final approach or after landing.

Glider landing short of Philadelphia Glider Council Airfield

Glider landing short of Randall, NY airport

It is amazing how many “Tree Landings” work out well for the pilot ……. you just need to stay in the tree.

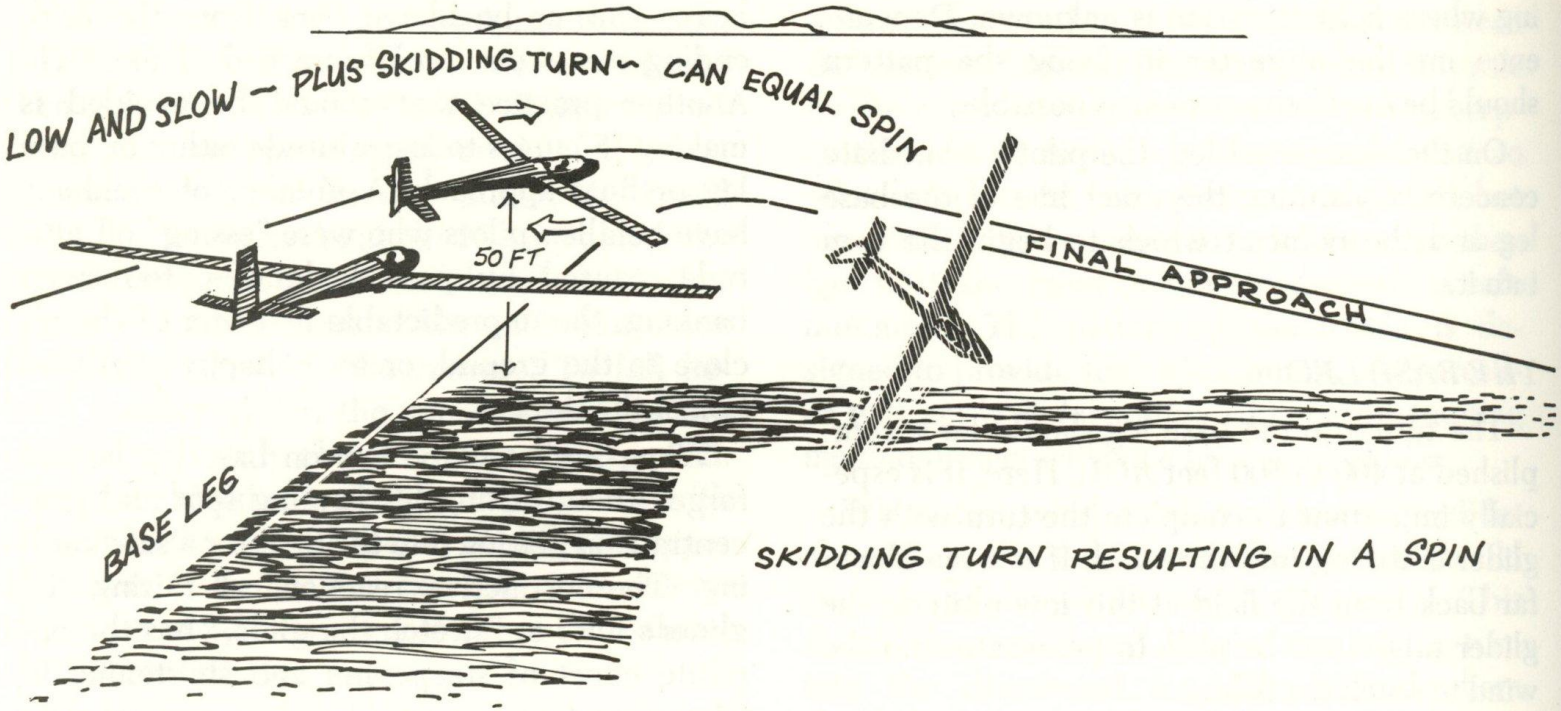
Landing short in the UK

Landing short of Kapiti Airport, New Zealand

Understanding the “Stall-Spin” accident!

This occurs when a pilot makes a slow, flat turn to final because he’s low.

- Low; “stretching” the glide; back stick => Slower
- Low; using excessive rudder => Skidding turns
- Banking tendency compensated with outside stick
- Outside stick increases AoA
- Slowing AS causes nose to drop; compensated with more back stick
- More back stick; More outside stick, More inside rudder, until finally ……STALL



- The inside wing “gives up” flying and drops.
- The C.G. is in front of the wings and causes a nose down pitch.
- The glider then impacts nose first.
- The outcome of a Stall-Spin accident is never good.

If you are confused about Stall-Spin accidents, then please spend time with a CFIG.

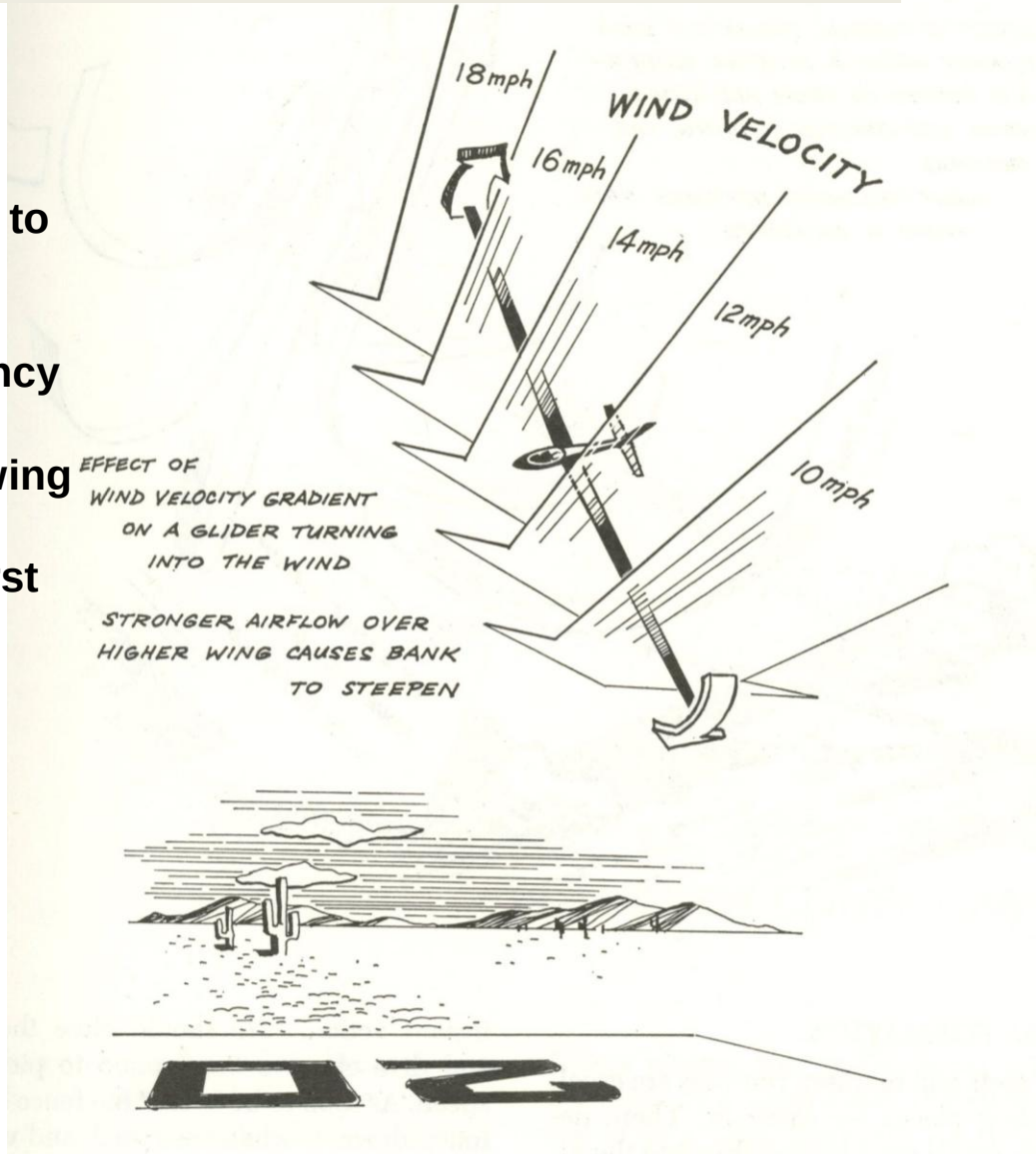
Probability of a stall-spin in a properly banked turn is increased by wind-sheer

Airspeed of high wing > low wing's
Lower wing will have higher AoA just due to this

Wind sheer increases overbanking tendency
Causes pilot to increase opposite aileron
Further increases angle of attack of low wing

If average airspeed is near Vstall in the first place, low wing can stall even w/o a skid

Remedy-
- **Keep airspeed up**
- **Keep yaw string straight**
- **For normal landings, steep approach w/ turns above wind sheer**



{ Video clip of a Stall Spin accident. }

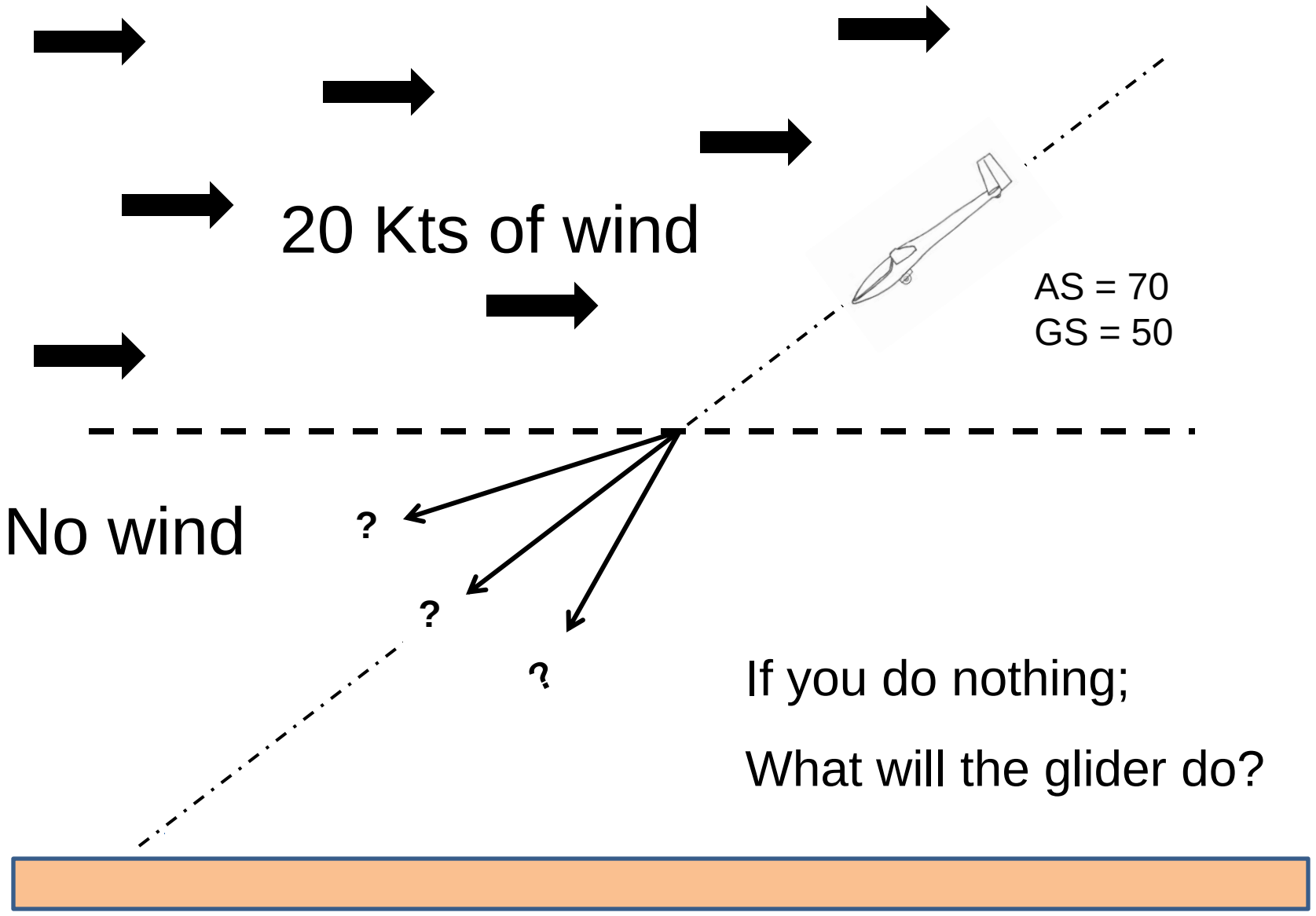
Your reaction to a stall should be instinctual and immediate.

- **Stick forward (decrease the AoA)**
- **Get the airspeed above Vstall**
- **Keep yaw string straight**

During your landing turns you should only be concentrating on two things:

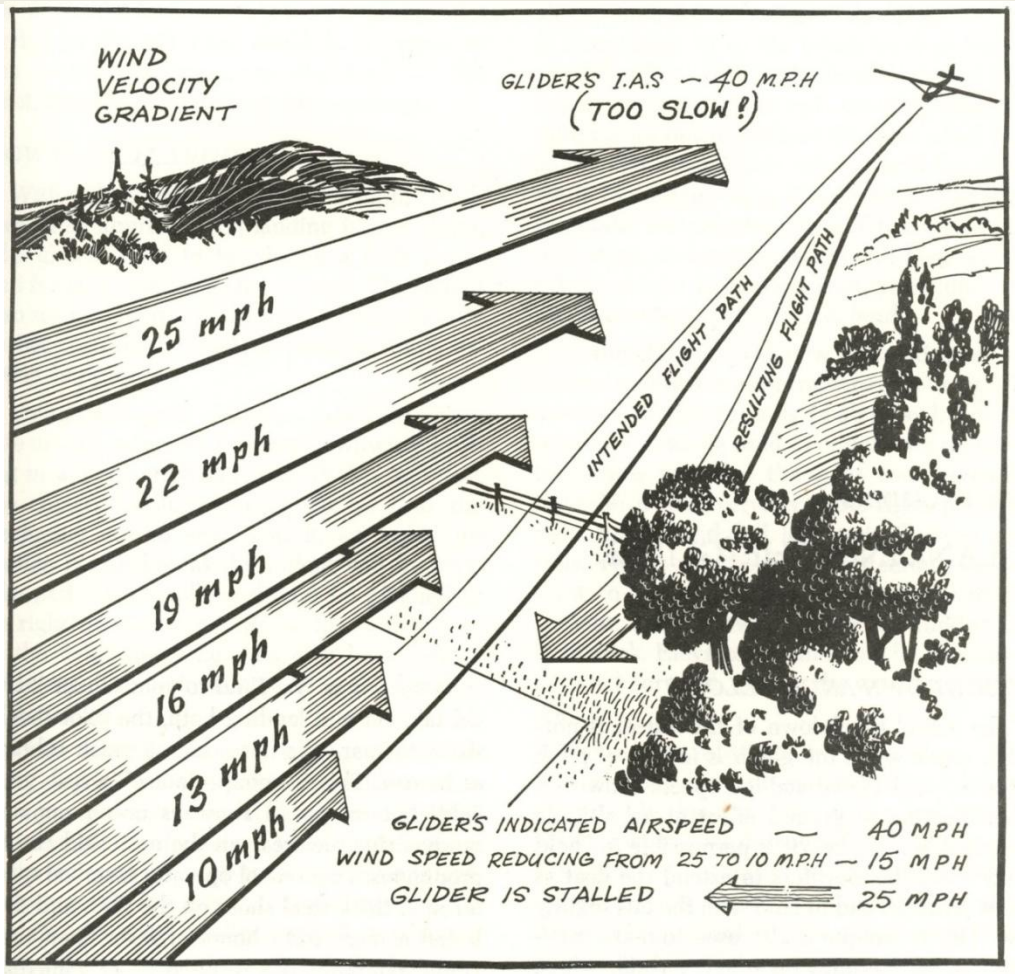
- Airspeed
- Yaw String

Landings & The adverse affects of winds


20 Kts of wind
AS = 70
GS = 50
No wind
?
?
?
If you do nothing;
What will the glider do?

Various atmospheric effects can cause you to drop below your expected flight path

Wind Shear

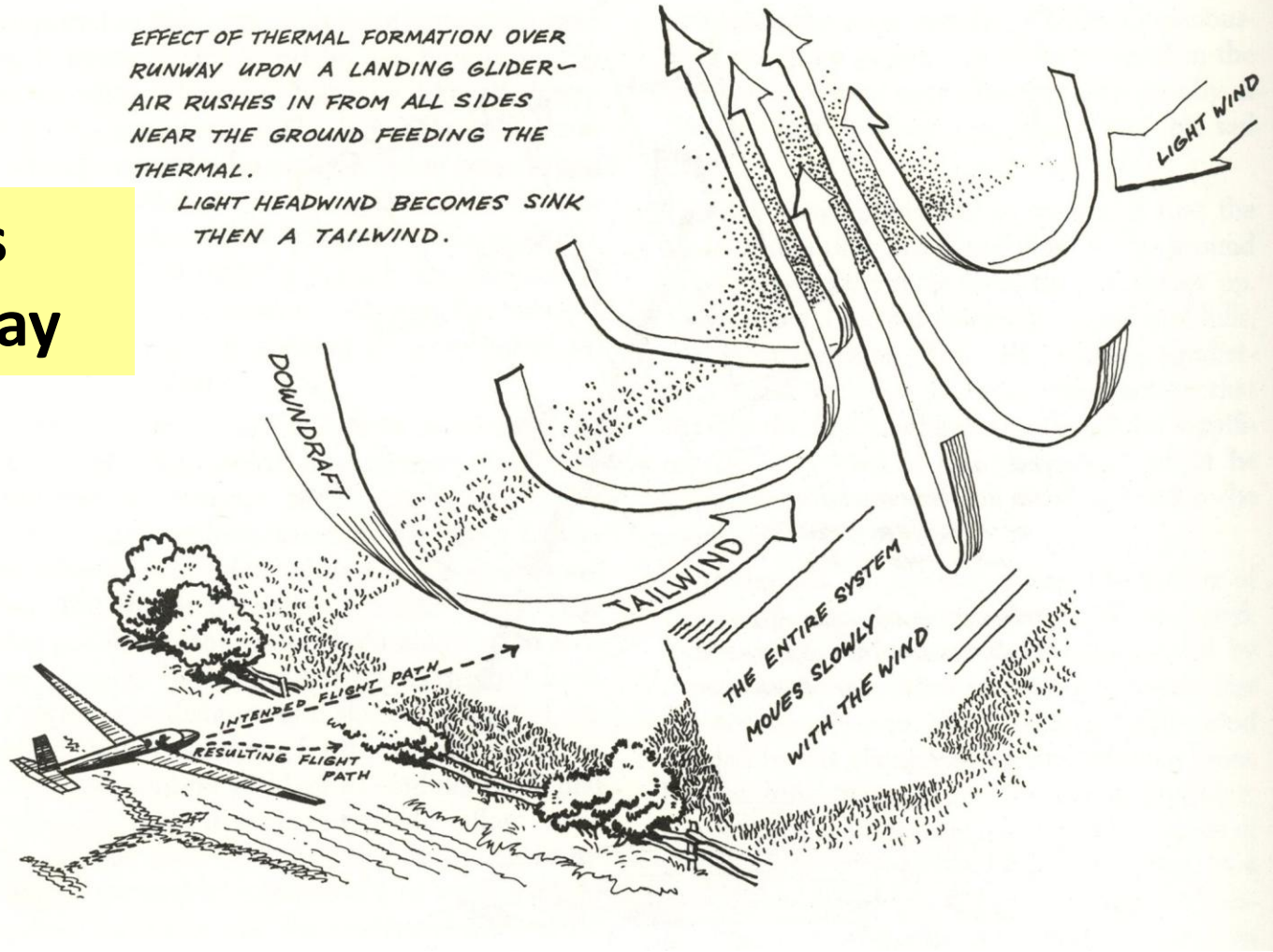


Various atmospheric effects can cause you to drop below your expected flight path

Runway threshold on edge of plateau; wind blowing down runway can cause strong downdraft on final

Various atmospheric effects can cause you to drop below your expected flight path

Thermal forms over hot runway

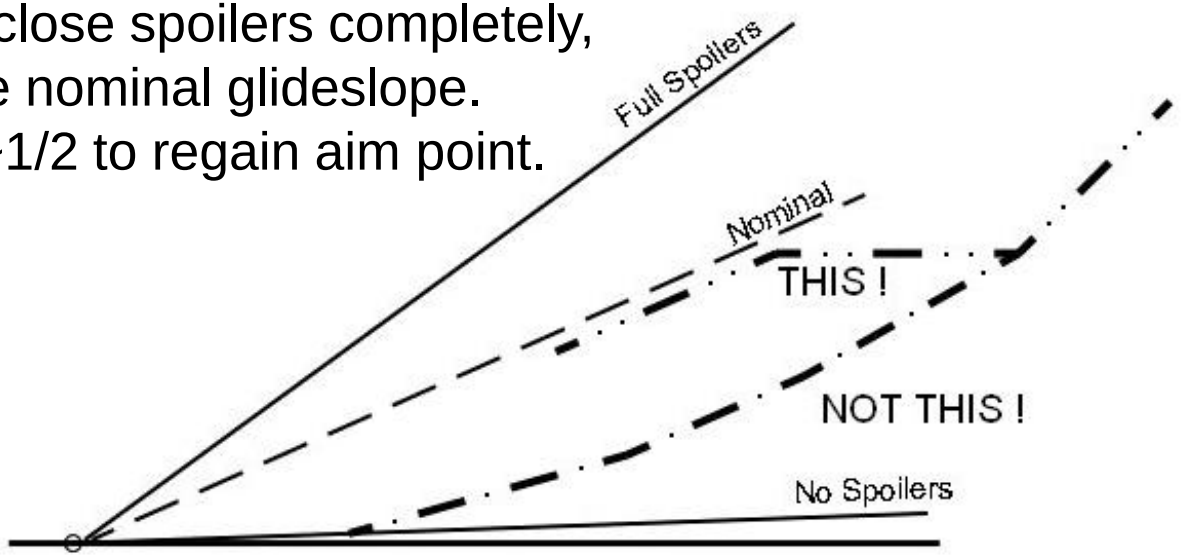


Avoid land-short accidents by making steep approaches

Steep approach = glide path you would get in calm air with ½ to ¾ spoilers

Because of wind shear, sink, or whatever, you find yourself progressively closing the spoilers to maintain your aim point.

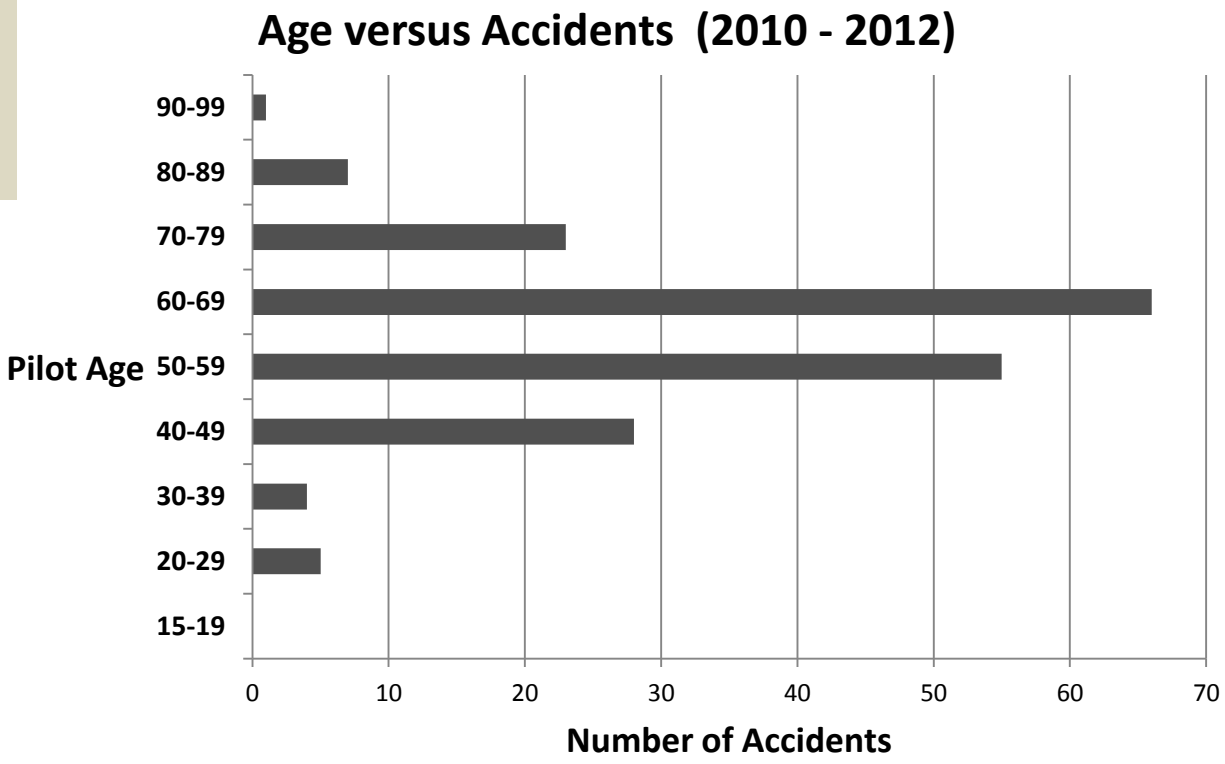
When this happens, close spoilers completely, fly flat to intercept the nominal glideslope. Then open spoilers ~1/2 to regain aim point.



It’s not only gliders that risk land-short accidents by making shallow approaches

{ Video clip of a low approach airplane accident. }

Who are they ?

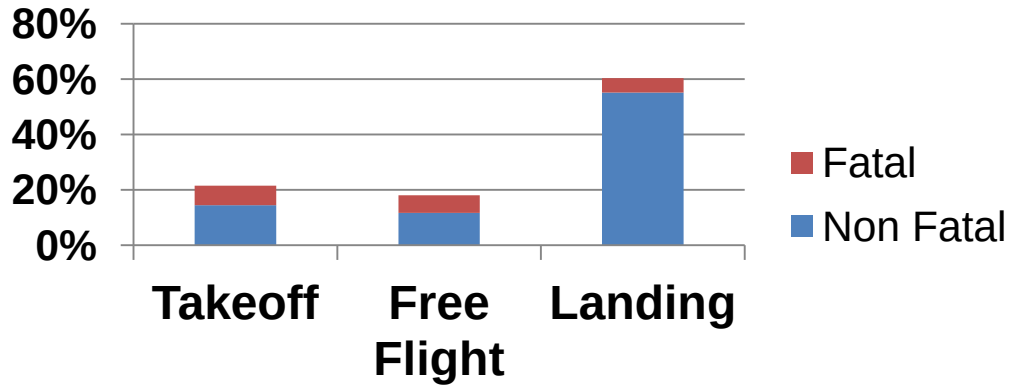


Pilot Ratings and Accidents (2007 - 2013)

Rating	Accidents
Student Pilots	35
Private Pilots	215
Commercial (Non CFIGs)	147
CFIG's	50
	447

Rating	Accidents	%
Student Pilots	35	7.8
Rated Pilots	412	92.2
	447	100.0

In Summary



All these accidents were preventable !

We are all vulnerable.

Be Careful, Be Attentive, and Be Ready

Suter Safety Talk

The End