



## Risky Business

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Sandwiched between hope and fear is the element of risk. Where the former transforms the future, the latter limits the horizons. Risk, however stranded in the middle, is the potential exposure to an existent hazard. It is the element of risk that enables one to undertake formidable tasks with sometimes, deleterious consequences if known risks are not mitigated. It is the potential, the known and the unknown.

Okay, okay, let's not get carried away here. Risk is inherent to life. It starts with the first glow of conception. A single base-pair mutation in the DNA can cause some horrible consequence that mars the life of the newborn. And yet there are fortunately few of those, because the body has a built-in mechanism, a DNA Mis-Match repair gene that corrects faults and aborts large-scale variances from the norm. It is a kind of Risk Mitigation strategy by the genome for preservation and propagation of life. Otherwise we would all have three or four arms and five or six legs, eyes in the back of the head, breathe through our abdomen, and consider that beautiful!

We humans are adept at risk-taking. It is this unreasonableness that gets us to expand our horizons, but it is the same that reduces one's lifetime. Advances in science and civilization have always been due to a few "unreasonable" risk takers. These few have seen the existing hazards and identified them as risks and brought personal and external resources to bear, to mitigate these risks before venturing out. They advanced us at great personal peril but were well informed and understood the consequence of the unknown. If not for the risk taken by Chuck Yeager, the sound barrier would have remained as such. If not for Neil Armstrong, the footsteps preserved on the lunar landscape would not be photographed and preserved. If not for the young pilots of WWI and WWII the lessons learned would not have saved countless lives from safety programs developed after the war. Yes these rules that describe risks are written in the blood of those that did not recognize them or of those that flaunted them. And yet, I speak from both sides of my mouth, vindicating the risk-taker and in the same breath vilifying him. Not good!

There is an answer to this dichotomy of thought. The earlier and current risk-takers are those that undertake an endeavor knowing the hazards that exist and mitigate the potential. Those unknown hazards are what concern them the most. They train extensively for all known eventualities. Unfortunately human failings show up even then, such as cold weather and O-Rings – the cause for the Space-Shuttle Challenger disaster in January 28, 1986. And in February 1, 2003, even with the tightest controls, foam debris striking the leading edge of the shuttle Columbia lead to the disintegration of the Thermal Protective System (TPS) – resulting in the subsequent disaster. These were some of the most closely monitored events where human failings from multiple sources including "financial reward and image pressures on the launch date" ended the former flight while accidental expulsion of debris doomed the latter.



An aircraft crash startles us but does not surprise, because underneath the slushy stream of cause and effect there is the sequence of errors, unchecked but verified, charted yet unrestrained lending veracity to the “pilot error” and human frailty.

As pilots we undertake a known risk when we fly. These risks are well known and well understood. Most general aviation pilots incur these well-known and established risks on every flight. Avoidance of which leads to a fruitful and long healthy flying-life. Accidents occur because of a long string of pitfalls and not one event or “It happened just this time.”

On a recent one-hour flight for a hamburger, I took a friend of mine to expose him to this wonderful adventure. He seemed perplexed when we settled down at the table at the airport restaurant.

“So that’s all there is to it?”

“What do you mean?” I answered.

“I mean, there were no loops or rolls or all that stuff,” he stated with incredulity.

“No that is for the Aerobatics part of flying,” I said defensively.

“This is no fun. No adrenaline. Nothing. Just like sitting home in an armchair without my internet, Wii or remote for the TV.”

So there it was in a nutshell. It’s his personality. He drinks Red Bull, drives his Mitsubishi faster than the speed limit and speeds up to get through a yellow light at an intersection. Having said that, he is a good friend, but I never let him drive me around. His thought process is common to risk-taking. It is seen in adolescents and in young adults where certain personalities, altered through experiential reference, are given to sensation seeking, impulsivity and social and regulatory violations. Unfortunately this is not only a failing of the low time pilots but also occurs in high time pilots where experience gives these pilots a false measure of “personal invulnerability.”

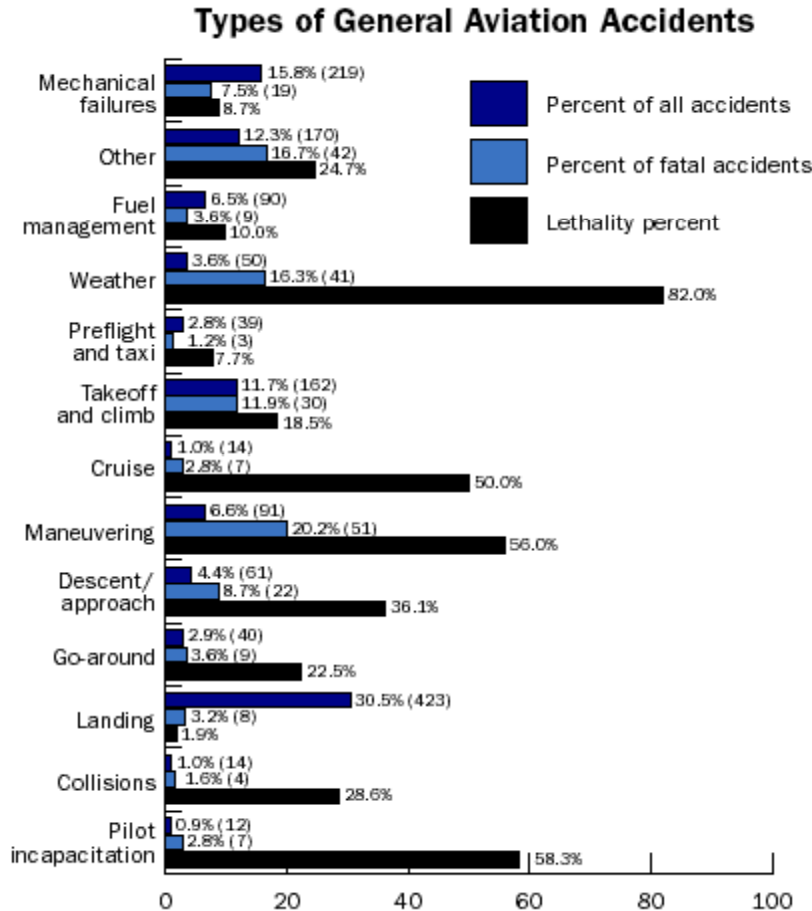
The risk-takers who are on an adrenaline rush are the athletic, busybodies, rushing to meet obligations where they are inevitably late and are the same ones who have the mentality of Get-there-itis. They fly through bad weather and more times than not they get away with it until, that fateful day when nature has other plans.

Many scientific studies have probed this in detail and these personalities exist for several reasons. Many individuals during their childhood have a fear of death that makes them do idiotic things including risky sexual behavior and callous disregard for authority, since they feel there is “nothing” to lose. Others have the personal invulnerability halo above their heads and a “bring it on” wild look in their eyes. These traits are easy to recognize but slow to dismantle.

Pilots face many hazards when flying and yet most if not all can be mitigated. Eighty-five percent of all causes of GA accidents are blamed on “pilot error!” A little voice in my head is unable to reconcile this statistic and speaks out, “What about the fifteen percent?” That diversionary statement basically leads to the fact that we as humans have



a tough time facing the facts even when they are neatly stacked in front of us. It is our failing!



The most common of these pilot mistakes can be lumped into the following categories:

- A. Knowledge.
- B. Experience.
- C. Decision Making.

Knowledge and Experience can enhance our skill-sets to undertake all the underlying six categories of aircraft control in order to enable us to make a reasonably safe flight, but it is the Decision Making that protects it all with the umbrella of safety. Risks inherent in flight occur in all the various stages of flying:

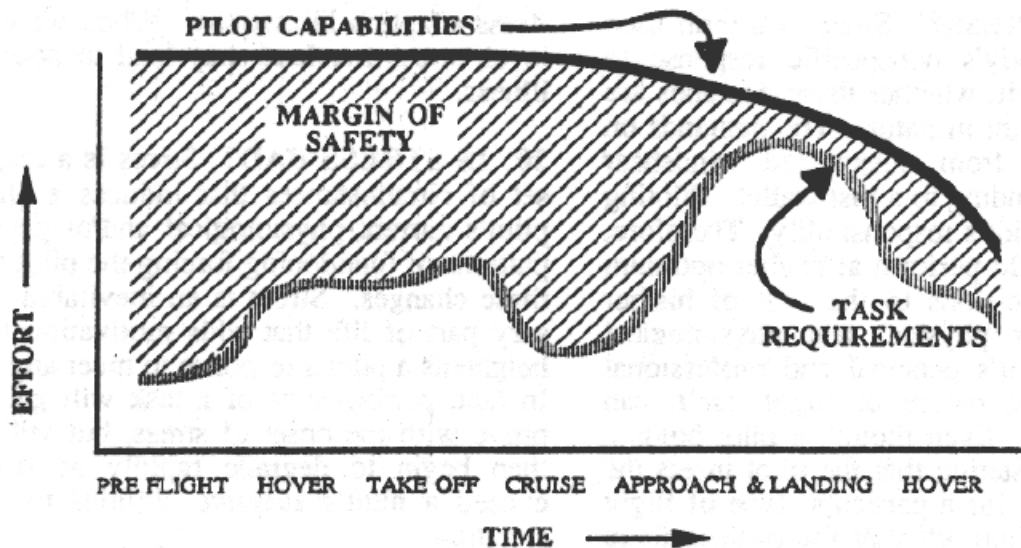
We humans make decisions at different levels based on our personal skill-sets and our relative experiential past. For instance there is a scientific term called the Confirmation Bias that makes us repeat a process that has been successful in the past. If you have done some scud running and successfully negotiated your way to your destination many times your mind is setting up a confirmation bias to the point of ignoring any potential pitfalls that may exist because of the terrain, the cloud ceiling or visibility conditions. The past may determine the present behavior and set you up for a disaster by ignoring the inherent



risks. This bias may also set you up with the optimistic bias that precludes all potential adversarial hazards in one's mind with the "can-do" approach an over-confidence of sorts that maims, kills and destroys families.

Similarly, flying into "known icing" conditions by a pilot in defiance of the "weather briefer" might have been successful for the pilot once or more, but repeating the exercise is throwing caution into the face of definite adversity. The weather briefer is, of course, never 100% accurate because he does not know the exact weather conditions in any one spot at any one time. Weather is forever changing on a micro/macro and meso-scale and current weather briefing or Pireps should always be considered "old news" and a past event. Pilots must learn to respect conservatism in making decisions for flight.

1. Take-Off
2. Cruise
3. Maneuvering
4. Mis-fueling/Exhaustion/Starvation
5. Approach and Landing
6. VFR into IFR/Scud Running/Thunderstorms/Icing etc.



### THE MARGIN OF SAFETY

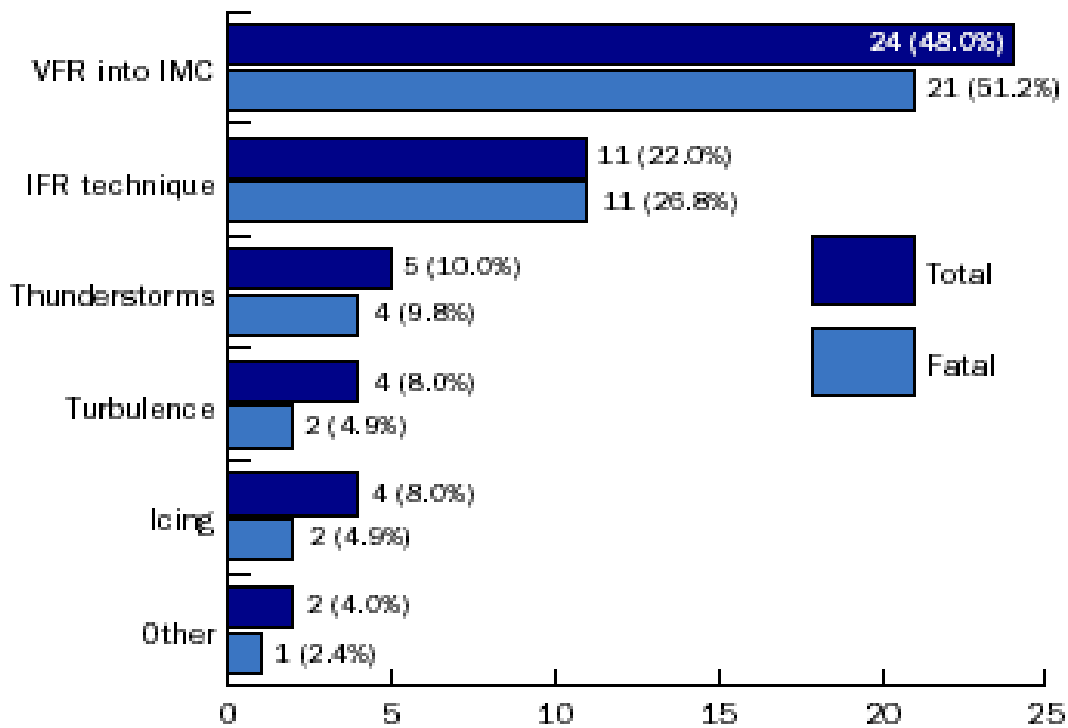
1. **Take-off:** Here the margins for safety are small but reasonable, except if you lose power below 750 feet. If that happens you as a pilot must consider options of controlled flight onto a field or safe –landing area within 60 degrees on both sides



- to the direction of your flight. Returning back to the airport at or below this altitude is fraught with danger. The angle of bank if increased beyond 30 degrees will lead to a substantial loss of the vertical component of lift and cause the aircraft to stall and potentially spin into the terrain.
2. **Cruise:** Low risk with a high margin of safety. Potential issues are mostly related to environment, but sometimes loss of an engine, though rare, can make your hair stand on edge. But the altitude is your friend and transitioning immediately into “best-glide-speed” and a swift check on the engine while navigating to a safe landing zone and communicating with ATC while squawking 7700 will save the day. Even though sudden silence from the engine is rare, most of these can be prevented with good maintenance (example: looking for metal in oil samples)
  3. **Maneuvering:** I bring this up since there are those whole like to impress girlfriends/boyfriends (although women are careful and more risk averse than men in general) and family with their ability to fly. The simple answer is “Don’t!” Tightening the turn radius while increasing the angle of attack leads to a known calamity called, euphemistically, a stall/spin accident.
  4. **Mis-fueling/Starvation and Exhaustion:** Always sample the fuel for contamination. A small sample of water in the tank is enough to make the engine cough out an expletive and die on take-off. But starvation is mostly related to mismanagement and lack of attention. If you run one side dry and don’t manage the fuel consumption then when the engine sputters the distraction can limit your thought processes. Always turn the knob and check the other side, with the fuel boost pump on, if the engine sputters. However, if you have exhausted both fuel tanks in flight then you are decidedly frugal, or not planning your flight properly or both. Remember cheapskates learn expensive lessons from their penny-pinching ways, especially in flying.
  5. **Approach and Landing:** Mishaps here are most commonly of the distraction kind. A belly landing with the gear properly stowed and preserved is not granted a kindly view by the Insurance Company. More importantly flying into a crosswind on short final requires knowledge of the aircraft rudder authority, the state of the runway – if clean or contaminated – the ability of the pilot and the fatigue factor of the pilot. One other factor to consider is whether there is another airport with a runway better aligned with the wind. If you are on a long cross-country flight, let “George” the autopilot, fly the plane so you are fresh on arrival for the approach and landing phase.
  6. **VFR into IFR:** This conundrum has many facets. For instance, how does one enter the clouds and not know that he is about to enter the grey soup? How does the blue sky suddenly turn grey? There are several reasons the mind betrays the VFR-only pilot and even IFR-rated pilots who lack the proficiency to successfully deal with this situation. A progressive decline in visibility as in haze and the progressive loss of visual reference can slowly caress the sensibilities of the pilot and lead him into the jungle of chaos when the realization is slow in coming. Encountering IFR conditions by a VFR pilot and plowing through them doggedly for thrills or simply to get-there is just plain stupid. Or sometimes the pilot is forced by the “Peer-Pressure” of another similarly rated pilot or non-pilot in the right seat.



The aircraft however does not know when it encounters the clouds, only the pilot does. The aircraft only realizes it's in clouds when the temperature is -10 to +5 degrees Celsius and icing forms on the leading edge destroying the lift and through air foil and air separation and/or carburetor icing that occurs and steals the life of the engine leading to dislocation and disruption. The airframe, however firm its strength, can be fractured, bent, or even ripped apart at the seams, or rivets, in an embedded thunderstorm. Few pilots have ventured there and most of them accidentally, and those that lived to tell the tale of the vicious drafts and turbulence and loss of control they experienced, do not wish to repeat the experience. That is a place where our better angels fear to tread. Safer pilots would do a 180 and head for the hills of safety and usually are proactive in their intent. Those that continue onwards into the contour-less grey clouds of convection are "less risk averse" and more influenced by psychological factors of "peer-pressure," "get-there-itis," and "I can handle it." Each kind thus earns his or her own fate.



**General Aviation Accidents (Nall Report)**

The results of a NTSB study showed those pilots that ventured ahead into IFR conditions unratred and/or unprepared, were less experienced and usually carried passengers aboard the aircraft. They were unable to make an appropriate assessment of the situation, develop risk appreciation and usually succumbed to social pressures.



So, can better decision making prevent us from being the casualty of the vicissitudes of mother-nature. The answer is an unequivocal, “Yes!” The following parameters, if followed routinely, will gift you with the designation of an “old-pilot.”

1. Follow the Checklist for a thorough preflight.
2. Get plenty of practice and experience.
3. Evaluate the PAVE model before each flight:
  - a. P = Pilot (current, rated, practiced and experienced)
  - b. A = Aircraft (safe, equipped and current)
  - c. V = environment (weather)
  - d. E = External Factors (Social/Personal Pressures)

After determining that the four factors listed above have all been considered and that the pilot is experientially rated and equipped with the necessary skill-set, he or she must then consider the acronym IMSAFE:

- a. I = Illness (Do I have any ailment?)
- b. M = Medication (Am I taking any?)
- c. S = Stress (Any recent personal, family or job related issues?)
- d. A = Alcohol (8 hours between bottle and throttle. A better rule is 12-14 hours between bottle and blast valve)
- e. F = Fatigue & Food (Acute = heavy workload or chronic = overworked)
- f. E = Emotion (Correlates with Stress)

Inadequate supervision of any, some, or all of these personal items leads to impaired judgment. Disaster, the devil that does not wear Prada, is there to swoop in and claim its prize.

Once airborne, however, and during the flight if something is amiss, there is one last acronym to consider: The DECIDE model.

- a. D = Detect (a change in status)
- b. E = Estimate (to counter the change)
- c. C = Choose (a desirable outcome in flight)
- d. I = Identify (the appropriate actions for successful outcome.)
- e. D = Do (the necessary action)
- f. E = Evaluate (the results of the action undertaken)

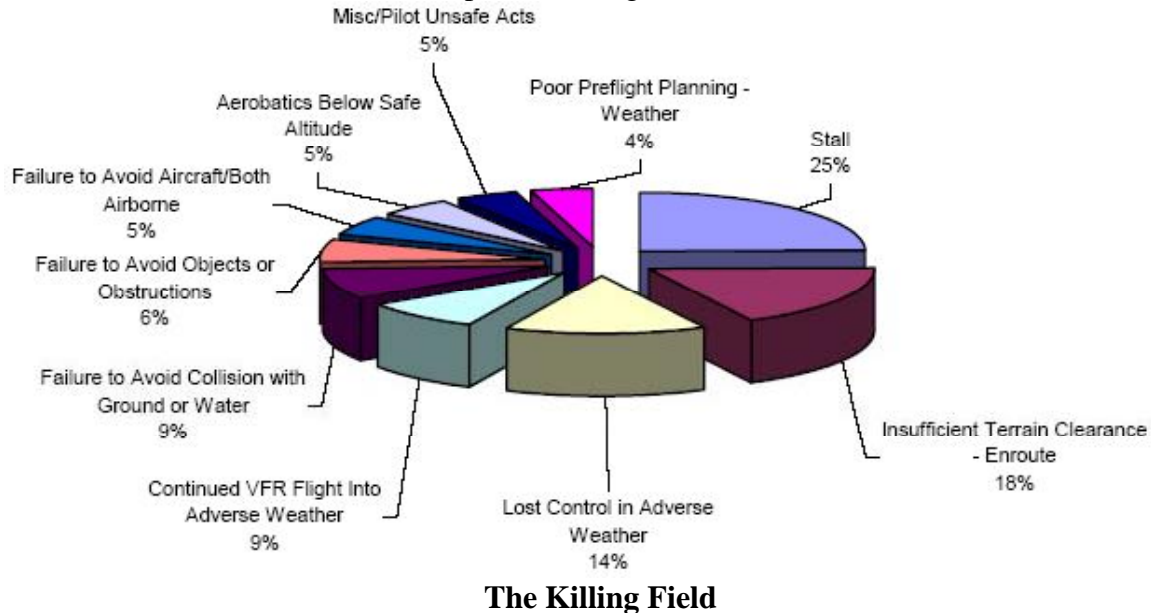
Flying is a risky business, but the risks are easily mitigated provided the known hazards are identified, understood and appropriate actions are undertaken to counter any irregularities or deficiencies.

Another piece of advice is that after each flight we must critique ourselves. It is a form of debriefing the self. Any and all, both good and bad, minor or major events during the



flight must be assessed for the overall improvement of future flight dynamics. Self-criticism is honesty at its best and safety at its minimum.

Good Decision Making can be taught through learning and training practices, it diminishes the numbers that make up the “Killing Field.”



### References:

1. Personality differences predict health-risk behaviors in young adulthood: Evidence from a longitudinal study. Caspi, Avshalom; Begg, Dot; Dickson, Nigel; Harrington, HonaLee; Langley, John; Moffitt, Terrie E.; Silva, Phil A. *Journal of Personality and Social Psychology*. Vol 73(5), Nov 1997, 1052-1063.
2. Relationship of Childhood Abuse and Household Dysfunction to Many of the Leading Causes of Death in Adults The Adverse Childhood Experiences (ACE) Study *American Journal of Preventive Medicine*, Volume 14, Issue 4, Pages 245-258 V.Felitt
3. A longitudinal study of the reciprocal nature of risk behaviors and cognitions in adolescents: What you do shapes what you think, and vice versa. Gerrard, Meg; Gibbons, Frederick X.; Benthin, Alida C.; Hessling, Robert M. *Health Psychology*. Vol 15(5), Sep 1996, 344-354
4. Sensation seeking, risk appraisal, and risky behavior1 *Personality and Individual Differences*, Volume 14, Issue 1, Pages 41-52 P.Horvath, M.Zuckerman
5. Pilots' perception of risks and hazards in general aviation. *Aviat Space Environ Med*. 1990 Jul;61(7):599-603. O'Hare D. Department of Psychology, University of Otago,





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Dunedin, New Zealand.

6. Pilot behaviors in the face of adverse weather: A new look at an old problem. Aviat Space Environ Med. 2005 Jun; 76(6):552-9. Batt R, O'Hare D. Australian Transport Safety Bureau, Canberra, Australia

7. Risk tolerance and pilot involvement in hazardous events and flight into adverse weather. Pauley K, O'Hare D, Wiggins M.J Safety Res. 2008;39(4):403-11. Epub 2008 Aug 3. Department of Psychology, University of Otago, Box 56, Dunedin, New Zealand

8. Human factors analysis of accidents involving visual flight rules flight into adverse weather. Goh J, Wiegmann D Aviat Space Environ Med. 2002 Aug;73(8):817-22. University of Illinois at Urbana-Champaign, Aviation Human Factors Division, USA

9. The Nall Report 2009.

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