Risk Management For Pilots

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The majority of all aircraft accidents are attributed to pilot error. Most accidents occurred because of a chain of events or factors that contributed to the accident. If any one of these events in the chain had been broken or stopped it is likely that the accident could have been avoided. Break the chain, prevent the accident.

Although the number of accidents occurring during flight training is relatively small compared to that after flight training, there is not enough emphasis being placed on risk-management training during flight training. Statistics show that the number of accidents that occur after flight training -- that is to say after students receive their Private Pilot Certificates -- increases by 80%. During flight training, the accident rate is approximately 5 accidents per 100,000 flight hours. After flight training, this rate increase to approximately 9 accidents per 100,000 flight hours. Since there is not enough emphasis being placed on risk management during flight training, the pilot is left with doing things on a trial-and-error basis. He may do something that he has never done before or press his limits beyond what he has done before and if he is successful, he then evaluates the outcome: "Just how risky was this, how did it make me feel, would I do it again and, if so, would I do anything differently? Was the outcome worth the risk?" If he was unsuccessful, well, he probably does not have to worry about doing that again. It is often said experience comes from making mistakes. We can not possibly hope to make all the mistakes required to make us experienced pilots. So what are we supposed to do? We learn and hopefully we can learn in other ways than from the school of hard knocks. In the flying business, the school of hard knocks can be extremely unforgiving.

The following will be an attempt to give us a few tools we can learn to use to manage the risks associated with every flight. Proper risk assessment and management begins before the flight -- sometimes days before the flight -- and continues throughout the flight until we land and the engine is shut down.

Flying seems to be all about acronyms and I am going to present a couple of them here. Some you may have heard of already and some may be new to you but -- if used consistently -- data show that these tools significantly reduce the risk and the number of accidents and incidents. (King Schools has also used these in their new Practical Risk Management DVD, which AVweb has reviewed.)

PAVE Your Way

P = Pilot. What kind of shape are you really in? Use the I.M.S.A.F.E. checklist. Are you familiar with the aircraft that you are getting ready to fly or have you only flown it once? What about the avionics; are you up to speed on how to use them? Are you current and proficient? You may be legally current but not proficient. Are you IFR current? When was the last time you flew in actual IMC? Are you up to the challenge?

A = Aircraft. Are you using the right aircraft for the trip or are you using a 145-horsepower Cessna 172 that has a service ceiling of 13,000 feet to cross a long stretch of mountains that top out at 11,000 to 12,000 feet? Are you up to speed on the aircraft performance and limitations and have you checked...
them? What about weight and balance? Will it carry the required payload as well as fuel? Does all the required equipment and instrumentation work? Even if a piece of equipment is not required by regulation, would it make your life a lot easier if it worked?

V = EnVironment, meaning environment. What is the weather forecast to be? What about ceiling and vis? How does the actual weather compare to the forecast? Is it better or worse than forecast? Will you be flying into improving or worsening conditions? If you're flying over mountainous terrain will you be IMC or will the ceilings be a comfortable level above the minimum enroute altitude? Where is the freezing level? Don't forget winds aloft and winds at your destination. If your destination is forecasting a stiff crosswind at your arrival time, did you check it against the aircraft's demonstrated crosswind capability? Speaking of crosswinds, if your airplane has a 17-knot demonstrated crosswind capability, don't forget that is based on a dry runway. If the runway is wet, that number is significantly reduced. If you are flying at night don't forget to check all interior and exterior lighting before your departure -- airborne is not the time to realize that none of the cockpit lighting works. I'm sure that you checked all en route and destination NOTAMs for any airspace restrictions and TFRs, right? Unless you ask briefers for the published NOTAMs, they will not give them to you. If the NOTAM has already been published, it is assumed that you already have read it. Always ask for any published NOTAMs that may affect your route. Also, don't forget survival gear and appropriate clothing for the type of terrain you will be flying over. Many times one survives the crash only to be killed from exposure to the elements.

E = External Pressures. Why are you making this trip? Are you in your best friend's wedding -- which is tomorrow -- and since you could not take vacation you could not leave earlier, so now there is a ton of pressure for you to make it? Are there people waiting for you at the airport because you told them you would be there at a certain time, or do you have to get to an important meeting that can ultimately affect your career? External pressures can place a huge demand on us to make the trip.

Pilots are typically goal-oriented people and allowing these external pressures to be placed on us can make us take risks that we otherwise would not take, pushing that proverbial envelope. Knowing this, plan ahead and leave yourself an out. Build in extra time in case your groundspeed is slower than predicted and you have to make an unplanned fuel stop. Speaking of fuel stops, you can never have too much gas unless you are on fire. Don't keep pushing into your reserves. My personal minimum -- as well as that of the flight school I teach out of -- is one hour minimum fuel in the tanks when I land. Depending on the weather, I might bump it up a little. If you have someone waiting at the airport for you, tell them you will be there an hour after you really plan to arrive. I would rather I have to wait than have a friend or loved one wait on me and then start to worry. Have an airline option. Remember, if you absolutely have to be somewhere on time, your chances are better with the airlines. The bottom line is life is all about having options and one can not have too many options available when it comes to flying.

As stated in the beginning, no one thing causes an accident; it usually takes a chain of events. The events that create this chain have a cumulative effect. The more things that are stacking up against you, the higher the odds are that you will have a bad experience. Don't let it happen to you.
Take CARE In Flight

So, we have gone through our risk-management checklist and now we are airborne. Well, guess what? Another acronym: C.A.R.E.

C = Consequences. As the flight continues things are constantly changing. We, as pilots, need to evaluate these changes and decide what consequences they are going to have on the safe outcome of this flight.

As the flight progresses, the pilot gets more and more fatigued. The aircraft is constantly changing too: For example, it has less and less fuel and it may have developed a maintenance problem. The environment may be changing too. For example, it may be getting dark, the visibility might be dropping, the ceiling might be dropping, and the winds might be picking up, which will also affect that precious fuel you thought you still had.

What about external pressures; can they be changing too? Sure they can. For example, the closer you get to your destination, the more pressure you are going to feel to proceed to your destination rather than making a smart choice to land short and wait out the weather, purchase more fuel, etc. The closer you get, the more likely you will press on. Statistics show that most fuel-exhaustion accidents occur only a few miles short of the destination airport. There should be no excuse for that. For all of the changes listed above, ask yourself what the consequences would be if you took no action and just continued. Ignoring any one of them and deciding to just press on could have disastrous results.

A = Alternatives. As the flight progresses, always be thinking of alternatives in case something out of the ordinary or unexpected occurs. What if you suddenly had a passenger become sick or your destination airport -- served by only one runway -- is closed when you arrive because of a disabled aircraft on the runway? Do you have enough fuel to hold until the runway is reopened or to divert to another airport? What if the weather starts deteriorating worse than you expected? All too often, non-instrument-rated pilots continue flying into worse weather because they are almost at their destination. The results are often disastrous, ending in controlled flight into terrain (CFIT). There is no excuse for that.

My wife and I were flying back from Vegas and I had only one cup of coffee before departure, knowing I could then make the trip nonstop. After all, the same strategy worked for the flight to Vegas. Anyway, we were on our way back and I started feeling that all-too-familiar feeling but I just squeezed a little tighter knowing I could make it. Well, guess what? We were overhead Visalia, Calif., when I couldn't take it anymore. I thought I was going to die. I started an immediate, rapid descent to an airport. I threw the A/FD at my wife and told her to look up the pertinent information. The truth was that it really didn't matter at that point what the pertinent information was. I was on a mission and I was going to land no matter what. There was one aircraft in the pattern and I announced my position and my intentions to do a straight-in landing. I landed, did a high-speed taxi to parking and did a rolling shutdown. Fortunately I had the presence of mind to set the parking break before I exited. I ran across the ramp to the facilities, where life once again became good.

In evaluating that experience I realized that I had an emergency on board although I did not declare one. I did some stupid and unsafe things during that time. I blocked out all other things involved with flying the airplane and had only one thing on my mind. The point is, I didn't have an alternative plan. I could have landed sooner before things got to that point, or I could have been prepared for such an annoyance and had something on board the aircraft into which I could have relieved myself. Lesson learned and, fortunately, nothing bad happened.

As your flight progresses towards your destination, your available options decrease: You have less fuel and less range and are more fatigued. The bottom line here is to try to think of all possibilities and suitable alternatives before you depart.
R = Reality. Don't deny that things are starting to go south. Recognize the situation, accept it and then develop an alternative plan. Accept as reality that the weather is getting worse, you're eating more of your fuel reserve, you're running late and now it is getting dark, and you're not that comfortable flying at night. The number-one cause of cross-county fatalities is continuing VFR flight into worsening weather. Accept the reality and do something about it. This process is not something you can just do once. It is an ever-evolving process. If things are starting to change, things aren't going as planned or you are developing aircraft mechanical problems, accept the reality, develop a plan, implement the plan and then evaluate again to see if the plan is working. If the plan is not working then develop another alternative plan. Implement it and re-evaluate and continue the process. Don't just sit there and do nothing and accept a bad outcome. To do so will seal your fate.

E = External Pressures. Again we see that external pressures play an important role in the successful outcome of a flight. In fact, external pressure is the most significant of all risk factors. External pressures make pilots ignore all other risk factors -- the "I just have to get there" mentality. It is the reason we keep going when we should land. There are two little people that live in our head. The one little guy is the conservative one. He tells us, "You know, you really ought to land and wait this out, or get more fuel," or whatever the case may be. The other little guy that lives in our head is the one that says, "You can do it. What are you, a wimp? You're almost there, don't stop now." It is this second guy that you need to ignore, and listen to the first guy, the more conservative and safer guy.

The number-one job as a pilot is risk management. This task can never stop. Use the P.A.V.E. checklist prior to flight and then use the C.A.R.E. checklist while in flight. Pay attention to your gut feeling and instinct. Never, ever give up or resign that there is no hope. As long as you are still flying, there is always hope. Always look for ways to learn more by attending seminars and flying with an instructor more often that just once every 24 months as required by regulation. Take some specialty training. Always look for ways to broaden your educational horizons.

Remember, there are old pilots and bold pilots, but there are no old, bold pilots.