Awareness, Accidents and Airmanship (part two of a three part series)

By John Matylonek

In part one in this series on accident prevention I described **technical, procedural and strategic** pilot errors. As training and challenges escalate, the ability to recognize challenges, make decisions, delay gratification, recognize dangers and fluidly adapt to situations becomes even more important. **Situational awareness** and proper performance becomes a critical skill to develop. Lack of training, preparation or attention is an obvious cause of pilot error. But not reviewing skills or continually learning or adapting are more subtle factors. **Currency, conditioning, versatility and chance** are major contributors to the three types of pilot error. This article provides more explanation how these factors affect readiness. Furthermore, it doesn't matter how good you are. If you fly in increasingly extreme conditions or chose small safety margins, you will find the limits of technology and human skill. This can happen early and later in a flying career. No one, including this author, is immune.

Ambiguity and Situational Awareness

Pilot errors are sometimes mysterious - even to those that make them. But even a fuzzy response to the question "Ugh, why did you do that?" is instructive. A lack of situational awareness is often the underlying cause. Situational awareness is the perception, comprehension and projection of variables that will affect a flight. Situational awareness makes good decisions and performance in flight more likely, though it doesn't guarantee it. That is because awareness must be followed by correct performance or action. For example, I have seen pilots stall spin their gliders, not realizing that they were providing the continuous input for the spin. Situational awareness may include knowledge of your current physical and mental state and how it may affect your flight.

Perception is especially important because it only in the here and now - without much thought or emotion - that we can experience the world as it really is. Accurate perceptions and ideas are can only be close approximations of reality, and depend on the extent of training and experience of the pilot. Vivid imaginations, conditioned habits, needs for approval, strong beliefs or self-concepts, wishes, ratings and desires often interfere with perception (reality). This internal environment must be assessed as objectively as the outside environment. Proper comprehension relies on choosing relevant from irrelevant perceptions and strategies of what constitutes a safe flight.

In a nutshell, do not believe everything you think and do not act on every impulse. Flying decisions can be tricky in a constantly changing environment. How can we deal with the ambiguity? Reliable pilots disregard irrelevant perceptions by using the GATHER model to consider the flight and DECIDE model to react to changing conditions once in the air. Safe flight plans are generated from these accurate perceptions and strategies. A good flight plan provides adequate safety margins and at least one back-up plan.

GATHER MODEL

Get all information available about the flying site or situation.
Assess present skill level, specific ratings and recent experiences that apply.
Think of possible safe strategies for action, controlling for variables.
Hone the skills needed by review, instruction, or special preparation.
Enforce rating or personal limits and safety margins.
Reward yourself for having displayed maturity and airmanship.

Gathering Information

Sites are very different and their weather conditions constantly change. Each have different pitfalls throughout the day. Local pilots are the best source of information for avoiding the dangers since they fly the site most often. Site guides found on club websites are fountains of useful information that also include site regulations and protocol. Recognizing the challenge is half the challenge!

Information gathering is a continuous process that gets more detailed right up to the day and moment of the launch.

Walking the landing zone, testing the launch footing, asking about specific launch techniques and watching others perform are part of this information gathering process. Many a hard landing can be avoided by choosing a large, smooth and clear surface to land, using wheels and proper run-out techniques, landing into the wind and seeing the proper approach strategy in action. Ask, **"what specific experiences have I had that apply to the current situation?"** Controlling for variables often requires the ability to delay flight or make special preparations until the necessary conditions exist for safe flight. This includes finding supervision, instruction or honing necessary skills through practice. For instance, landing in the high desert requires the ability flare above the sage brush at high groundspeeds. This can be practiced at the training hill by incremental ballasting. Determining personal and technological limits requires accurate self-assessment and emotional maturity. After considering any risks, and making preparations (even if it's early dinner plans), remember to reward yourself. This is especially important if other, less conservative or more skilled pilots, have taken some risks and are now flying or going farther.

Attention Preferences

Detecting change and properly reacting to change is the essence of skillful flying. This is affected by the way people process information. All pilots have a finite capacity and a preference for processing information. Individuals have varying capacities of directing this limited capacity toward one thing. Training, interest, fascination, need and importance modifies' this capacity and preference in pilots. Despite this, pilots still may not be paying attention where it is needed for complete situational awareness.

Some pilots prefer to be "linear" - directing this attention on one thing at a time for long periods in a sequence. Other pilots prefer to use a "cyclical" tactic – divvying up their parcel of attention among several things in cycles for shorter periods. Both have their advantages and disadvantages. Cyclical pilots see the relationship and meaning between facts easier and are "big picture" kind of people.

They are spontaneous, flexible and great fun at parties. Cyclical pilots are more easily distracted from safety procedures or relevant details - requiring tactics to get back on track. Linear pilots are more impressed by sensory data and logical progressions. They are reliable, predictable and probably organized the party. Linear pilots may miss relevant details that diverge from the routine or the expected - requiring a tactic to see out of the box. Linear pilots may be uninterested in developing raw physical proficiencies and learning-by-doing. Cyclical pilots may be too undisciplined or creative in their approach to learning or preparation. The best strategy is a combination of the two. The big picture and sense data provides the context in which the best decisions are made. Free-flight requires fluid interaction of the two modes.

Key to Airborne Decision Making

The DECIDE model – used consciously or not – is the most effective way of processing relevant information in flight. Scanning the environment for dangers and not fixating on any one problem (or even an euphoric feeling) is key. If the change turns into a problem that is inevitable, a vivid image of what can be done to avoid the danger is essential. This image is followed by actions which are evaluated for effectiveness. Sometimes, you have to try something else if it didn't work. None of this decision-making must be in the context of dire situations. For instance, sometimes a change in wind direction necessitates choosing a different, safer landing zone. This simple recognition and simple solution, if acted upon, is just a normal decision that has been part of the great flight.

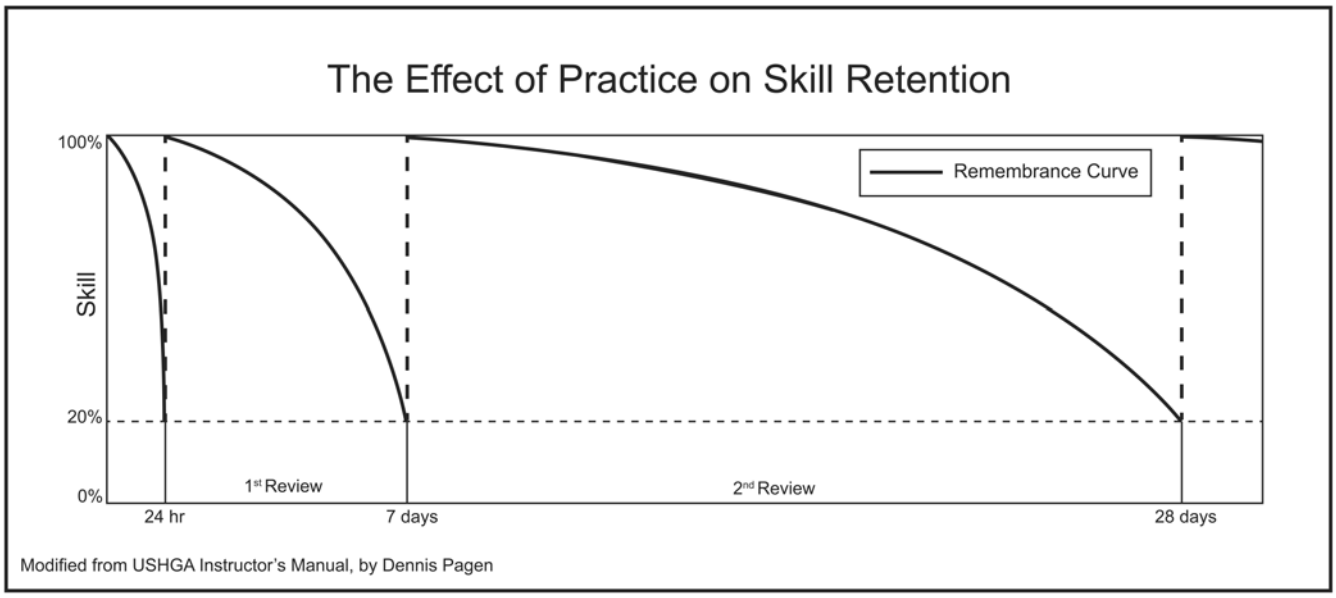
DECIDE MODEL
Detect the fact that a change has occurred. **E**stimate the need to counter or react to the change. **C**hoose a desirable outcome for the success of the flight. **I**dentify actions which could successfully control the change. **D**o the necessary action to adapt to the change. **E**valuate the effect of the action.

From FAA Pilot's Handbook of Aeronautical Knowledge

Be curious about the changing air, that weird looking cloud, terrain clearances, glide to safety, other pilot's behavior, glider feedback and equipment. Develop contingency plans in case the original expectations do not work out. If you are confused, use your radio and ask for clarification. Situations are constantly changing so having flexible flight plans based on the latest information is essential. Being able to shift gears and respond (sometimes within seconds) to new information is vital to safety. Know the limits of your aircraft in all situations.

Currency

Ratings are simply snapshots of skills developed at a particular time. Those skills are subject to atrophy.



Without practice, our muscle and mental memories get rusty. Many accidents occur when a pilot returns to the sport or certain aspect of it after a break. They choose a first flight that calls on too much of their previous skill. In fact, the Curve of Remembering shows how much a learned skill is lost after a layoff. The curve shows the substantial loss of newly developed skills with time-off. Conversely, it also shows that a solidly learned skill is increasingly resilient to weakening – even when laid off for longer periods.

Practice any skill till unconsciously competent. Do not skip steps before going to the next logical step. Periodically review previously learned skills to keep them reliable.

Once a skill is learned well and tested under various conditions for long periods, it only takes a small amount of practical review to return to previous levels of performance. Just like a return to bicycling, we may be wobbly but remain upright - unless we choose a steep mountain trail. This is the main reason new pilots must fly as much as they can in those first couple years of a flying career. Only when flying skills are solidly ingrained does it become a practical recreation. But these skills are very specific. For example, as new pilots learn how to soar very quickly with modern instruction, airtime increases. But, launch and landing frequency decreases drastically. This degrades the recently learned launch and landing skills. This can be countered by several concurrent intensive reviews of launch and landing while consolidating high altitude skills. Annual launching and landing training throughout a flying career is the best way to stay sharp. Or, after a long layoff, a more elaborate review sponsored by your instructor. But it can be as simple as simulating the movements in a safe environment just before flight (e.g. practicing with the new zipper on the ground or kiting in the set-up area or performing a dry run takeoff with those new fat and faired down-tubes)

Conditioning and Consistency

Someone once said that indecision is the key to flexibility. Conditioning, the opposite of flexibility, freezes a pilot into one decisive state or action. It also plays a role in accidents. We get habituated in certain ways in the long and short term. Flying skills become specifically adapted to local conditions and launch and

landing methods. For example, pilots that primarily winch tow launch with high angle of attack may have a developed a bad nose high habit for mountain launching. Another example is launching and landing in ideal conditions can lead to the expectation of easy flight. As conditions change slightly the launch and landing can be blown using the earlier technique. A more subtle kind of short-term conditioning can happen within one flight. Launching and flying in strong conditions may require vigorous arm exertion and control input. However, the occasional calm LZ requires finger tip sensitivity to feel the subtle glider feedback. The first case necessitates the willingness to train new skills. The second case requires recognition of the change in the conditions and subsequent technique change. Again, review of underutilized skills is necessary if we are to fluidly adapt to changing conditions.

Versatility

Linda Evangelista, the supermodel, quipped "I can do anything you want me to do so long as I don't have to speak." Versatility is one of the hallmarks of the prepared pilot. Different sites, conditions, launch methods provide the opportunity to exercise different intellectual, emotional and physical skills. This broadened experience generalizes to more situations. A pilot that gets three hours of airtime from three distinct sites is more prepared than the pilot with three hours from one site. A certain level of restricted achievement sometimes creates the illusion that free-flight is forgiving, easy and ultimately predictable in all circumstances. Erroneous belief in ones versatility is often the cause of the intermediate syndrome – the tendency of a major mishap at the intermediate level. The moment you think you have finally mastered this flying thing, is the time you are ripe for a major mishap.

The solution to this syndrome is getting out there and experiencing many conditions – as unstructured and wild as they are and dealing with the ambiguity using the GATHER, DECIDE and mastery models. This is a joy to many free-flight pilots. It enhances alertness and caution. It engenders humbleness and a beginners mind. Some may consider this too inconvenient. One person’s inconvenience is another’s adventure.

Chance as a Factor

Probability starts to play role in accidents. Days and sites with extreme variability may be safe one minute but unsafe the next. As pilots become advanced they choose to experience more variable and turbulent conditions or need narrower margins to achieve earlier levels of stimulation. Those that consistently choose situations in which top-end conditions may exceed skills are playing a roulette wheel. Enough of these lucky flights assure the illusion of safety, further breeding a false sense of reliability.

The Lemming Effect

We are the other furry (insulated) creatures that dive off cliffs in masses. The **Lemming Effect** is the tendency of a group of pilots to enjoy the same kind of luck. Once a flying act is performed and gotten away with, despite its inherent high risk level, other pilots are tempted to perform the same. You can have an entire community of pilots of exhibiting risky behavior that is considered normal or even “cool”. It usually takes a serious accident to wake up the community.

Flying in marginally safe booming conditions certainly has its rewards. High and long or fast and low flights are part of the culture of performance and achievement. We all want to acknowledge and encourage those that push the envelope and contribute to the art. However, highly competitive pilots may soon find themselves on a slippery slope where limits of the technology and art of free-flight are tested by Mother

Nature. Awareness of this edge is essential before choosing these risks. **Simply ask yourself, I’m I a lemming?**

Conclusion

A seed of doubt, caution, and boldness is often the best combination when approaching new situations. Doubt keeps us humble and our minds open to whatever nature throws at us. Asking what prior experiences apply often keeps us honest with ourselves and encourages preparation. Caution provides personal limits, safety margins and contingency plans. Boldness allows us to take advantage of the opportunities that arise and allow us practice the skills we have previously honed. A smooth and constant sea has never created a skilled mariner. Thus, flying frequently, enjoying different sites and conditions provides more challenge, interest and opportunity to exercise the skills that ultimately make us safer pilots. Learning to fly different types of gliders also expands our experience and understanding. Some pilots may accept more or less preparedness in their quest for achievement. The latter, though eventually accomplished, have often arrived there through many harrowing experiences. The school of hard knocks philosophy shows true intent and desire but does not show much regard for ones health and responsibility to the flying community. The ability to delay gratification and prepare is the most essential personality trait for safety in free-flight. This character is often trumped by other habits of mind. The next article will detail hazardous attitudes or personality traits that often get pilots into trouble. It will also extend the causes of accidents beyond pilot error into the social and organizational realm.

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