AIRBORNE PUBLIC SAFETY ASSOCIATION

The Safety Wire

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AIRSPEED, ALTITUDE AND IDEAS…

Never run out of all three at the same time. At least two are always needed to successfully complete the flight. Some versions of the mantra swap ‘brains’ for ‘ideas’, but the message holds true for every flight. Of the three, altitude and airspeed are always dependable resources, held accountable by cold, calculating physics. Ideas are not as foolproof and are infested with countless potential points of failure. Interestingly, the same three elements determine not only safety, but also the quality of public safety resources.

A new UAS operator recently asked me what the best altitude was to fly an aircraft, manned or unmanned, when performing a search. I responded that the best altitude was the highest they could fly within the capabilities of the optics being used. Altitude offers more options for airspeeds, viewing angles and zoom ranges. Altitude also offers more options and flight profiles that will allow the pilot to respond to emergencies. There is no tactical advantage to being lower than the camera, binoculars or naked eyes need to be to see the target we are looking for. When we sacrifice altitude unnecessarily, we surrender both tactical and safety advantages.

Lower altitudes are sometimes required for our work. Hoisting, firefighting, fast roping, landing offsite, or legal altitude restrictions may put us close enough to terra firma to leave us with just airspeed and ideas. Airspeed at lower altitudes can be a more difficult element to balance than altitude. Safety of flight generally benefits from higher airspeed as altitude decreases. Tactical effectiveness is hampered by higher airspeeds. When it comes to a search, we want a nice, steady, slow scan of the area. If the scene is changing too fast, the eyes will not have time to focus on small targets. What is the best airspeed? The fastest airspeed that still allows a reasonable scanning rate of the target area, depending on the 'sensor' and conditions. Altitude makes it easier to find this speed.

When either altitude or airspeed are not playing in our favor, we are left with 'ideas'. The ability to use our brains is dependent on the quality, range and recency of training we have received in any role we play in the aircraft. Our sack of ideas must go far beyond those that are needed to handle normal operations. We need to be complete masters of our craft. Minimum standards and stale training will not make up the difference for a lack of airspeed and altitude when Murphy's Law is applied. What training should a public safety pilot have? The maximum amount available. A Tactical Flight Officer (TFO) should have enough training to provide numerous ideas of how to work a call. If one's list stops at, "flying circles in the sky," the sack of ideas is not going to change the outcome much. In many ways, this third element of our equation is as simple as the first two. More training equals more ideas.

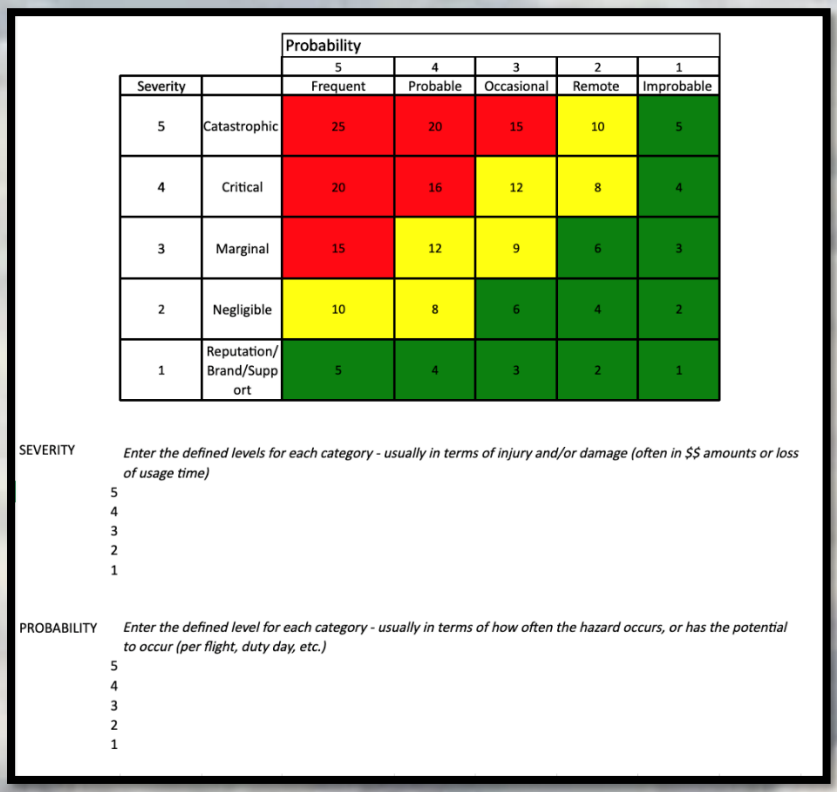
The beauty of this topic is how much control we have over our own fate. Sure, our world tends to throw the unexpected at us as a matter of normal business. However, we control the basic elements driving the conclusion of those events. We can determine our energy in terms of altitude and airspeed. Just in case that energy is lacking, we can bring enough expertise to maintain an advantage in safety and effectiveness by taking the time to train whenever possible. It is a personal choice that will make all of the difference in the world at some critical, unpredictable, point in time.

"It is not legality or guarantee that determines our safety, but how well we can fly."

~Richard Bach

SMS Techniques

What does, ‘frequent’ mean? How about, ‘critical’? One of the main reasons we use a risk matrix is to remove the element of opinion when defining risk. We never want our safety program to seen to be controlled by personal estimations of what is unsafe. The values given to different levels of risk should be based on definable parameters and applied uniformly to all hazards addressed by your Safety Management System (SMS).



		Probability				
		5	4	3	2	1
Severity		Frequent	Probable	Occasional	Remote	Improbable
5	Catastrophic	25	20	15	10	5
4	Critical	20	16	12	8	4
3	Marginal	15	12	9	6	3
2	Negligible	10	8	6	4	2
1	Reputation/ Brand/Support	5	4	3	2	1

SEVERITY *Enter the defined levels for each category - usually in terms of injury and/or damage (often in $$ amounts or loss of usage time)*

5
4
3
2
1

PROBABILITY *Enter the defined level for each category - usually in terms of how often the hazard occurs, or has the potential to occur (per flight, duty day, etc.)*

5
4
3
2
1

Sit down with your safety committee and define what each level means. When it comes to probability, or likelihood, the group needs to determine how often the hazard is occurring. Is it every flight, once a month, once a year?

The probability scale takes a little more work to define. Generally, you will label each level by two possible criteria. First, how much would the damage cost? The top category will be a complete loss of the aircraft. Each level below that will represent a smaller range of costs. Secondly, each category will cover a level of injury, starting with a fatality, and working you way down to minor injury. Consider including a category at the bottom of the range that does not involve any injury or physical damage, but leads to negative impact to your unit’s reputation. The risk matrix shown here is part of the APSA SMS Installation Guide.

ONLINE MEETINGS

APSA conducts regularly scheduled online meetings for safety officers, maintenance technicians, SAR personnel, and UAS operators via a conference call you can join using your computer, mobile device or phone. Online meetings are open to any APSA member. Contract maintenance providers to APSA members are welcome to participate

in the maintenance meeting as well. If you would like to join, send an email to: safety@publicsafetyaviation.org

The schedule for upcoming APSA online meetings is as follows.

Safety Officers:
Friday, Dec 11, 2020
1:00 PM – 2:00 PM EST (1800 UTC)

UAS:
Wednesday, Jan 13, 2021
1:00 PM - 2:00 PM EST (1800 UTC)

Safety Officers:
Friday, Jan 29, 2021
1:00 PM – 2:00 PM EST (1800 UTC)

SAR:
Wednesday, Feb 10, 2021
1:00 PM – 2:00 PM EST (1800 UTC)

Maintenance:
Wednesday, Feb 24, 2021
1:00 PM - 2:00 PM EST (1800 UTC)

EMERGENCY PROCEDURE OF THE MONTH

In each monthly emergency situation, discuss what you would do, as a crew, to respond to the following emergency. If the EP does not apply to your specific aircraft, think of something similar.

Complete loss of GPS signal in your area

"It takes around 45 hours to learn how to fly,

and a lifetime to learn when to fly.

~Unknown

Reality Check...

Note: *The following reports are taken directly from the reporting source and edited for length. The grammatical format and writing style of the reporting source has been retained. My comments are added in red where appropriate. The goal of publishing these reports is to learn from these tragic events and not to pass judgment on the persons involved.*

Aircraft: Cirrus SR22
Injuries: 1 Fatal
NTSB#: WPR15FA082

https://publicsafetyaviation.org/images/Safety_Program_Overview/Report_90588_11_25_2020_3_43_44_PM.pdf

The noninstrument rated pilot departed during the late afternoon and flew over the southern portion of the Great Salt Lake. According to data recovered from the airplane's avionics system, which did not capture altitude, the duration of the flight was about 9 minutes. During the final minute of the flight, the airplane conducted a gradual left turn at an engine power setting of about 2,200 rpm. Shortly thereafter, the airplane impacted the lake. Postaccident examination of the airplane revealed no evidence of mechanical malfunctions or failures that would have precluded normal operation.

Local meteorological observations indicated that restricted visibility and fog were forecast throughout the area about the time of the accident. It is likely that the pilot encountered these conditions inflight and lost visual reference to the ground and/or horizon. Given the pilot's lack of an instrument rating and of recent instrument flight experience, the loss of visual reference likely resulted in spatial disorientation.

Toxicological testing on the pilot revealed the presence of bupropion, an antidepressant; hydrocodone, an opioid analgesic; and diphenhydramine, a sedating antihistamine. The investigation was unable to determine if the use of bupropion or the cognitive effects of any underlying depression contributed to the accident. Because the hydrocodone was found in the urine but not the blood, it no longer caused systemic effects and played no role in the accident. However, it is likely that the effects of diphenhydramine impaired the pilot's cognitive and psychomotor performance at the time of the accident, and contributed to his spatial disorientation.

Probable Cause and Findings

The non-instrument rated pilot's decision to depart into low visibility conditions, which resulted in spatial disorientation and a loss of control. Contributing to the accident was

the pilot's impaired performance due to his use of the sedating antihistamine, diphenhydramine.

Aircraft: Robinson R-44
Injuries: 1 Fatal
NTSB#: ANC14FA030

https://publicsafetyaviation.org/images/Safety_Program_Overview/Report_89299_11_25_2020_3_37_46_PM.pdf

The accident flight was one of several recent practice external-load flights that the pilot had been conducting with a 150-ft long-line and weighted barrel. The helicopter approached the airport from the north and then hovered over the approach end of runway 20R. At the time, two airplanes were in the airport traffic pattern for runway 20R, another was in the airport vicinity, and a fourth was departing from runway 2R toward the hovering helicopter. One witness reported hearing the accident pilot attempt to communicate with the departing northbound airplane, but no response was heard, and the airplane passed close to the helicopter. After the northbound airplane passed by, the helicopter moved to its normal landing area on the east ramp, and the accident pilot responded to another pilot's query as to his intentions by stating that he was landing. Immediately after the pilot's response, the helicopter suddenly pitched up, rolled left, and descended to the ground.

The pilot's autopsy identified severe coronary artery disease with greater than 75% stenosis in two main arteries. In addition, scarring in the left ventricle was identified, which indicated that the pilot had experienced a previous heart attack. Although the pilot had sought and received in recent years medical care that included cardiac testing, there is no evidence that his previous heart attack was ever diagnosed (research has shown that the tests are not always accurate), and he was not taking any preventive medication. Given the presence of two severely stenotic lesions in two main arteries, the presence of scarring from a previous heart attack, and the absence of medication to prevent a recurrent cardiac event, the accident pilot's likelihood for experiencing another acute cardiac event was inevitable. An acute cardiac event would likely leave no identifiable evidence on autopsy and cause symptoms ranging in severity from impairing (such as chest pain and shortness of breath or palpitations) to incapacitating (fainting from low blood pressure or sudden cardiac death). Considering the precision required while maneuvering to land with an external load, any level of impairment could result in catastrophic consequences; therefore, the pilot likely experienced a sudden, acute cardiac event that adversely affected his performance.

Probable Cause and Findings

The pilot's loss of control of the helicopter due to impairment or incapacitation from a sudden, acute cardiac event.

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