The Safety Wire

July 2022

Max-Q is the maximum dynamic pressure that an aircraft or rocket can withstand without being damaged. It is a function of velocity and atmospheric pressure (air density). Basically, internal forces of a vehicle are pushing too hard against the pressures of the world around it. The concept is shown in movies when NASA's space shuttles would throttle back during launch until air density decreased enough to allow reapplication of maximum thrust.

Late last year I finally looked in the mirror and admitted that I was at Max Q. As with aircraft, the only way to avoid being crushed was to either decrease velocity or move into an atmosphere with less external pressure. Just like the shuttle astronauts, the only thing I have direct control over is the throttle. I made the heartbreaking decision to hand off the APSA Safety Program to a new person.

Serving APSA's membership as the Safety Program Manager has been the greatest honor of my aviation career. I have absolutely loved meeting so many aviation professionals from every aspect of the industry. I cherish memories of sitting at seminars and conventions chatting about aircraft, tactics and the hilarious absurdity we get front row seats to in this line of work. I always looked forward to talking on the phone or online through web-based meetings and emails, sharing information, articles and lessons learned with you all. I am

certain that I have 10,000 pictures of your aircraft that you have shared with me, or I have taken myself while visiting air support units.

Most importantly, this opportunity has gifted me with the chance to contribute to the success of public safety aviation around the world. I truly believe the work that you all do to support your communities and keep our sisters and brothers on the ground safe is honorable and heroic. The world is a better place because of this community. To be even a small part of all this is something I never thought I would have been blessed to do. To that point, I want to thank everyone at APSA for the opportunity, and support, these ten years. There are no words that can express my gratitude to you all.

It is because of my love for this work and our community that making the decision to stop was so difficult, and I want this to be the last message I am sending to you all in this final newsletter. For the space shuttle to make it to its destination, it needed to throttle back. It is counterintuitive for us to think less velocity facilitates a continued climb against gravity. Many of us push and push and push, until something breaks. Public safety is a famously unhealthy profession. We need to be wary of our environment and be proactive in taking care of ourselves, and others. It is not weak to throttle back a bit from time to time. Ultimately, it helps us achieve the goals we are pushing so hard to achieve. If the Falcon 9 rocket stayed at 100% thrust throughout the entire launch sequence, it would not make it to orbit.

This is not to say we need to close the throttle completely or stay at a lower performance level forever. The shuttle reduced throttle to 60-70%, depending on weight, and then went back to 100% when the air density decreased. This can be a stressful and difficult career. People are depending on us every day to get home safely. Technology and machinery are part of the equation, but the ultimate key to our success is the human factor. The ingenuity, passion, intuition and skills that make up the art of public safety air support are critical, and they will not work if we abuse ourselves like an old patrol car.

Take care of those we serve. Take care of each other. And most importantly, take care of yourselves my friends. Thank you.

“Nothing endures but change."

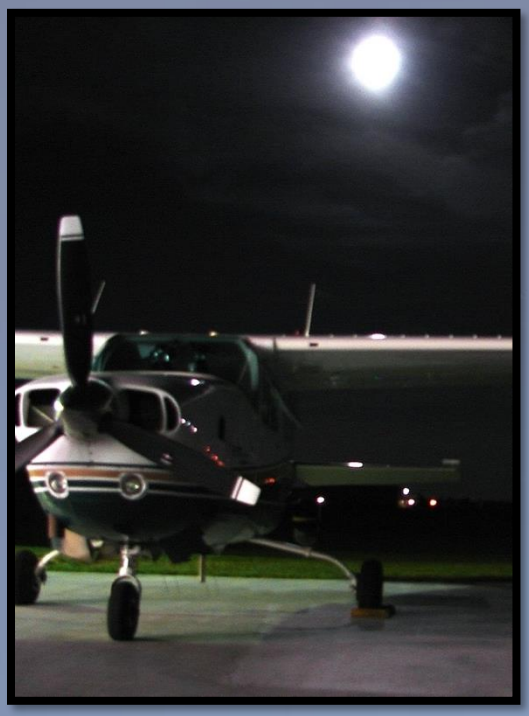
~ Heraclitus

In Memoriam

Sadly, as this newsletter was being prepared, we lost four colleagues from Bernalillo County following an aircraft accident. Lost were Undersheriff Larry Koren, Lieutenant Fred Beers, Deputy Michael Levinson and BCFD Rescue Specialist Mathew King. Undersheriff Koren and Lieutenant Beers were fellow APSA members. Please keep the Bernalillo County Sheriff’s Office and Fire Department, and the friends and family of these men in your thoughts and prayers.

APSA conducts regularly scheduled online meetings for safety officers, maintenance technicians, SAR personnel, UAS operators and natural resources personnel 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.



SAR:
Wednesday, August 10, 2022
1:00 PM - 2:00 PM EDT (1700 UTC)

Maintenance:
Wednesday, August 24, 2022
1:00 PM - 2:00 PM EDT (1700 UTC)

UAS:
Wednesday, September 7, 2022
1:00 PM - 2:00 PM EDT (1700 UTC)

Safety Officers:
Friday, September 23, 2022
1:00 PM - 2:00 PM EDT (1700 UTC)

Natural Resources:
Wednesday, October 5, 2022
1:00 PM - 2:00 PM EDT (1700 UTC)

"In soloing, as in other activities,
it is far easier to start something than it is to finish it."

~ Amelia Earhart

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.

Pilot is nodding off/obviously fatigued during a flight

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:	**SM-1019B**
Injuries:	**1 Fatal**
NTSB#:	**WPR21FA283**

https://data.ntsb.gov/carol-repgen/api/Aviation/ReportMain/GenerateNewestReport/103534/pdf

The pilot was attempting an intersection takeoff about midfield when, shortly after the airplane became airborne, it pitched up aggressively, rolled left, and descended into the ground in a nose-down attitude. Examination did not reveal any evidence of pre-accident malfunctions or failures of the flight control system, and there was no evidence to indicate that the pilot's seat had moved. Both the engine and propeller exhibited damage signatures consistent with high engine power at impact.

The airplane was equipped with a flight control locking system that comprised a pivoting, U- shaped control lock tube mounted permanently to the rudder pedal assembly and a forward- facing locking arm mounted to the pilot's control stick. The control lock immobilized the aileron and elevator controls but still allowed for near-full movement of the rudder and tailwheel.

The cabin floor, where the control lock tube should have been mounted for flight, was severely deformed and compressed. Had the lock been stowed during impact, it would have been pinned under the flight control stick, crushed longitudinally, and its retaining clip would have been deformed; however, the control lock and its retaining clip were essentially undamaged, and the lock was found raised off the floor.

Given this information, it is likely that the control lock was installed on the flight control stick during takeoff and impact. High-resolution security camera footage of the accident

revealed no discernable movement of the elevators or ailerons, further suggesting that the flight controls were immobilized by the control lock.

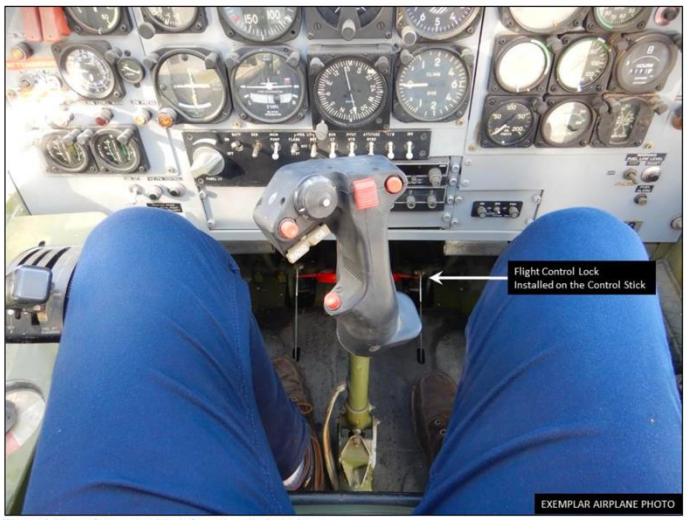


Figure 2-View of the control lock from the pilot's position.

Although the control is painted red, the pilots view of the lock in the engaged position is such that the lock is viewed at its narrowest profile, directly down its length. (Figure 2)

The pilot was reported to be extremely thorough about performing preflight checks. The pilot had limited experience in the accident airplane, which could explain why he did not remove the control lock during the preflight inspection. There was no video evidence to provide insight into the duration and scope of the pilot's preflight inspection; however, omission of the preflight control check was uncharacteristic given his extensive flight experience, and the reason it was not performed could not be determined.

The pilot was a retired naval aviator, and current air show performer, with extensive flight experience in a broad range of aircraft. He held a commercial pilot certificate with ratings for airplane single-engine land and sea, airplane multi-engine land, and instrument airplane. At the time of his last medical examination, on October 29, 2020, he reported 6,500 total hours of civilian flight experience.

Aircraft: **DJI Inspire 2**
Injuries: **1 minor**
ATSB#: **AO-2021-001**

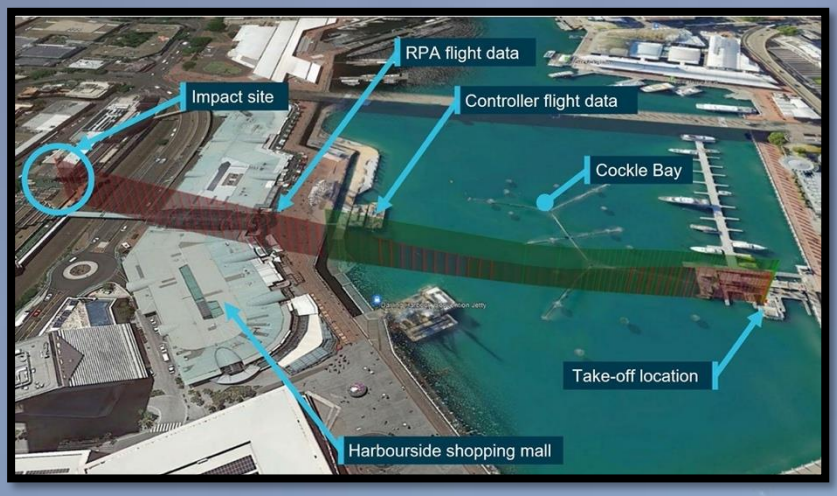
https://www.atsb.gov.au/publications/investigation_reports/2021/aair/ao-2021-001/

On the morning of 15 January 2021, a DJI Inspire 2 remotely piloted aircraft (RPA) was being used for aerial photography and videography. A short time after take-off the RPA unexpectedly accelerated away from the pilot. The pilot attempted to control the RPA and arrest its movement however, the aircraft was unresponsive to control inputs. The aircraft continued to accelerate to its maximum speed while flying away from the operator and towards nearby buildings. A short time later the RPA struck, and shattered, the window of a hotel. An occupant of the hotel received minor injuries from flying glass and the RPA was destroyed.

The ATSB found that shortly after take-off for the second flight of the day, the compass on the RPA failed due to electromagnetic interference. This resulted in the aircraft becoming unresponsive to control inputs leading to the collision with a building. Although not

triggered in this occurrence, the failure of the compass also disabled the Failsafe return to home function. Thus, the failure of the compass had the two-fold effect of rendering the aircraft uncontrollable while simultaneously disabling the failsafe designed to prevent a fly away occurrence.

The ATSB also found the pilot did not follow the operator's emergency procedures or comply with the regulators operational permissions to fly in restricted airspace.



Following a review of this occurrence, the manufacturer updated the user manuals of a number of products, including the Inspire 2. These changes provide additional guidance to users regarding the use of the fully manual attitude flight mode in the event of compass interference.

While the reliability of Remotely Piloted Aircraft (RPA's) is generally high, they are not infallible. Occurrences reported to the ATSB indicate that RPA fly-away occurrences are not rare. It is therefore important that pilots ensure they are familiar with and well drilled in emergency procedures, as well as being proficient in flying in all flight modes. In the case of an RPA fly-away, whether it be due to a compass failure or loss of signal, there may only be a few seconds in which a pilot can take avoiding action. In the event of a compass failure, switching to the fully manual attitude flight mode may assist regaining control of the RPAS. Whereas, following a loss of signal to the RPA, the last remaining risk control to prevent a fly away are built-in design features such as the Failsafe Return to Home.

Aircraft:	**Airbus ED135 P2**
Injuries:	**1 Fatal, 1 Serious**
ATSB#:	**AO-2018-022**

https://www.atsb.gov.au/publications/investigation_reports/2018/aair/ao-2018-022/

On the night of 14 March 2018, a EC135 P2+ helicopter was flown under the night visual flight rules to position the helicopter for a marine pilot transfer (MPT) from an outbound bulk carrier. The pilot in command was a company instructor who was supervising line training with a recently recruited pilot.

At 2330 local time, the helicopter was lifted off and climbed on track to the outer markers of the shipping channel (C1/C2), about 39 km from the port. Although the weather was

suitable for the flight, there was no moonlight, and artificial lighting in the vicinity was limited. Consequently, the approach to the ship was conducted in a degraded visual cueing environment that increased the risk of disorientation.

From a cruise altitude of 1,600 ft, the pilot under supervision descended the helicopter to join a right circuit around the carrier at the specified circuit height of 700 ft. During the base segment the helicopter's altitude started to increase, reaching 850 ft soon after completing the turn onto final at an airspeed of about 70 kt. Although the helicopter was higher than the target height of 500 ft, a consistent descent was not established, and the helicopter remained above the nominal descent profile. When the helicopter was about 300 m from the landing hatch, it was descending through 500 ft at a rate of about 900 ft/min. At about this point, a go-around was initiated, but the helicopter descended to about 300 ft before a positive climb rate was achieved.

The helicopter was turned downwind for another approach and subsequently reached 1,100 ft. A descent was then initiated without coupling a vertical navigation mode of the autopilot. This was not consistent with standard operational practices and significantly increased the attentional demands on both pilots and associated risk of deviation from circuit procedure. During the downwind and base segment of the circuit, the pilots did not effectively monitor their flight instruments and the helicopter descended below the standard circuit profile at excessive rate with decaying airspeed. Neither pilot responded to the abnormal flight path or parameters until a radio altimeter alert at 300 ft.
The instructor responded to the radio altimeter alert, reducing the rate of descent from about 1,800 ft/min to 1,300 ft/min. This response was not consistent with an emergency go-around and did not optimize recovery before collision with water.

After the unexpected and significant water impact in dark conditions, the helicopter immediately rolled over, and the cabin submerged then flooded. The instructor escaped through an adjacent hole in the windscreen and used flotation devices until rescued; however, the pilot under supervision was unable to escape the cockpit and did not survive.

The ATSB also identified a number of other factors that increased the risk of the operation. This included the pilot under supervision probably experiencing a level of fatigue known to adversely influence performance, due to a combination of limited sleep in the 48 hours prior to the accident and extended wakefulness on the day of the accident. In addition, the operator's fatigue risk management system (FRMS) relied extensively on a sleep reporting spreadsheet (sleep log), and multiple pilots on multiple occasions had entered unrealistic or inaccurate sleep times, and there were limited effective controls in place to assure that the sleep times being entered by pilots was accurate. At a higher level, the operator did not conduct a formal risk assessment of the roster prior to commencing operations.

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