Stan/Eval Newsletter
CIVIL AIR PATROL
UNITED STATES AIR FORCE AUXILIARY
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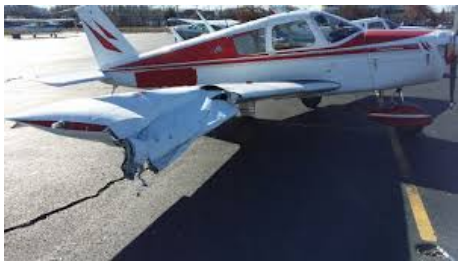
Preventing Taxi Accidents

No, we are not talking about two yellow cabs running into each other. There was a recent article in Flying Lessons on aircraft taxi accidents. This article also referred to an article on the same subject in Aviation Safety click here. Unfortunately, CAP is not immune to accidents on the ground while taxiing. There are many causes but one that is totally avoidable is distraction.



The fastest way to flunk a Form 5 (or Form 91) is to be heads down pushing buttons on the G1000 or your iPad while taxiing. This is a recipe for a taxi incident. We must enforce the discipline of staying focused outside the cockpit while taxiing. If you must get heads down, stop the aircraft and don't resume taxi until you are done. It's ok if there are two qualified pilots in up front to have one heads down if the pilot "flying" is heads up. But if you are solo or your right seater is not a a qualified pilot, stay focused on the taxi. This will save you, CAP, and whatever you might hit a lot of grief. Probably a good idea even if you are not flying a CAP aircraft.

There are other factors that can make a taxi end badly. Taxiing at night at a poorly lit airport can be risky especially if you are unfamiliar with the airport. Even in the daytime taxiing at an unfamiliar airport can be tricky. Trying to squeeze in between the fuel truck and another object has its risks. Taxiing in a strong wind can cause loss of control – make sure you have your controls positioned correctly. And sometimes the wind can be strong enough that taxiing safely just isn't possible. The Aviation Safety article noted a taxi incident when the pilot attempted taxiing a C172 at Grand Junction with the winds howling at 39 knots gusting 43. Yes, the pilot had the correct control inputs but a C172 aileron can't overcome that!

Taxiing safely can be problematic when there is a mechanical problem. Low tire pressure, shimmying nose gear, and faulty brakes can all make it difficult. So be sure to check these as part of your preflight.

Aircraft are designed to fly. Driving them on the ground is a secondary design consideration. And it shows. Aircraft don't drive like your Maserati. Taxiing off the runway at too high a speed and too sharp a turn ends badly. Taxiing too fast is like trying to drive your garden tractor at high speed. The handling is awful. Slow down!

How do we avoid taxi incidents?

- Heads up always when the aircraft is in motion. Leave any heads down tasks to when you are stopped or let the First Officer take care of it.
- When taxiing at a poorly lit airport, get all your lights on (taxi and landing) to better illuminate what's ahead and around you. Stop when you are unsure. Use your flashlight to illuminate to the side of the aircraft if possible. If in doubt, shut the airplane down, get out, survey the route with a flashlight, and then proceed once you convince yourself it can be done safely.
- Use your taxi diagram but don't be heads down as you taxi. Stop, study the plate, and then proceed.
- Don't taxi in a wind the aircraft can't handle. At slow taxi speeds, the control surfaces are not very effective.

GPS Interference

GPS has become ubiquitous in the aviation community and CAP air operations are no exception. However, GPS is very vulnerable to interference both intentional and unintentional. We often see NOTAMs identifying areas and times of degraded GPS operations. The problem is bad enough that the DoD is looking for help. According to the 5 October 2021 edition of Space News:

"The Defense Innovation Unit (DIU), a Pentagon organization that works with commercial companies, wants to take advantage of the growing availability of data from space and other sources to geolocate GPS interference.

A DIU solicitation in August asked for proposals on "situational awareness for intentional disruption of GNSS users." DoD is especially interested in "persistent, large-area coverage of falsified GNSS emitters that result in localized spoofing phenomenology."

GPS signals can be denied through electronic jamming attacks. GPS users can also be attacked with falsified PNT data, a technique known as spoofing.

"The entire world is dependent on GNSS-based systems, yet the GPS architecture and its users are vulnerable to denial and manipulation by adversarial actors," said DIU."

What this means for CAP is that we need to be able to do our air missions (and ground for that matter!) with or without GPS. So, let's not forget how to do dead reckoning, pilotage, and the use of VORs. GPS will continue to be the normal way of life, but in a national emergency, GPS could well go away altogether. We will still need to maintain our effectiveness and get the job done.

Special VFR for the CAP Pilot?

A recent issue of Flying Lessons had a good review of Special VFR. But for CAP pilots, we have additional limitations that greatly limits its use for us. First the basics from Flying Lessons.

"Special VFR is defined by 14 CFR 91.157 (https://www.govinfo.gov/content/pkg/CFR-2011-title14-vol2/pdf/CFR-2011-title14-vol2-sec91-157.pdf). Special VFR:
* Must be requested by the pilot. It cannot be offered by ATC;
* Is only permitted, however, when specifically cleared by controllers;
* Permits visual flight in visibility as low as one statute mile as determined by the pilot;
* Requires the pilot to remain clear of clouds;
* Requires certain aircraft equipment in daytime; at night requires the pilot to be instrument rated and the airplane equipped for IFR flight;
* Includes a host of other requirements and qualifiers as listed in the regulation; and importantly
* Is only authorized "below 10,000 feet MSL within the airspace contained within the upward extension of the lateral boundaries of the controlled airspace designated to the surface for an airport."

That last point might more easily be understood as meaning:
…within Class D airspace, or in Class E airspace around an airport, including extensions, when that controlled airspace extends to the surface (a Class E Surface Area)…
…which is fairly common at busier nontowered airports with instrument approaches.
...within a Class E Surface Area, depicted by a dashed magenta line

Special VFR:

* Is an exception to the VFR rule requiring cloud separation at least 500 feet below, 2000 feet laterally and 1000 feet above clouds in controlled airspace below 10,000 feet, and also no less than three statute miles visibility. If the pilot remains clear of clouds in at least one mile visibility, VFR flight is permitted…if cleared by Air Traffic Control.
* Exists only within the boundaries of Class D airspace or Class E surface areas—typically only four nautical miles around the airport, although this may be tailored to the location and often includes rectangular extensions along the extended runway centerlines. There is no exception to the VFR rules outside these small circles around these airports.
* Does not negate the requirements for minimum safe altitudes above terrain, obstacles and people as contained in 14 CFR 91.119 (https://www.ecfr.gov/current/title-14/chapter-I/subchapter-F/part-91/subpart-B/subject-group-ECFRe4c59b5f5506932/section-91.119): 500 feet above uncongested areas or 1000 feet above congested areas as defined by the regulation. There is also provision for flight over “open water or sparsely populated areas,” but most of the continental United States does not meet this definition.

In other words, Special VFR is a device used to take off from or land under VFR when the weather is below VFR minimums. It does not exist away from the immediate airport environment, nor is it an authorization for enroute flight below VFR minimums. Even if the pilot remains in uncontrolled airspace—usually within 1200 feet of the ground away from airports—the pilot must remain at or above the minimum safe altitudes.”

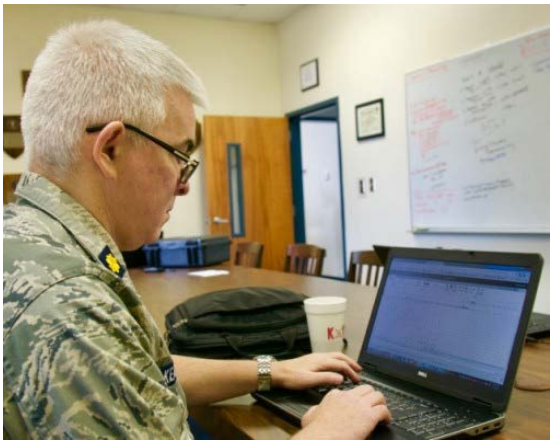
Good enough but let’s recall CAPR 70-1 paragraph 9.4.14 which prohibits special VFR flight operations by non-instrument rated pilots. In other words, VFR pilots can’t use special VFR when flying as a CAP pilot. Paragraph 9.11.7.2 also prohibits VFR flight when visibility is below 3 miles. So, when in Class G airspace below 1200’ AGL, to fly as a CAP VFR pilot, visibility must be 3 miles or more.

If we are a CAP instrument pilot, can we use special VFR? Before we answer this question, we need to ask why. If we can file IFR wouldn’t that be safer than going special VFR with all its risks? I can think of a few situations where I might be tempted. If there is a thin broken layer over the airport but clear VFR elsewhere then yes, I might. Otherwise, no. But we need to also consider the restrictions to IFR flight contained in CAPR 70-1 paragraph 9.11.7.4.1. This paragraph prohibits the release of IFR flights by an FRO when ceilings are below 800’ AGL and visibility less than 2 miles. Even if the FRO is a senior FRO you can’t go if ceilings are below 500’ and visibility 1 mile. So, forget about shooting an approach with 200’ ceilings and a half mile visibility. And forget about using special VFR when the ceilings are 800’ and visibility 1 mile. Yeah, there are exceptions, but they are rare.

Bottom line is that for CAP flying, special VFR is not really a practical option.

Flight Release – A Key Quality and Safety Process

Flight Release Officers (FRO) provide a critical service to CAP ensuring both safety of flight and quality of service. Releasing even a seemingly routine and benign flight should never be taken lightly. The fundamental law of flight release is: "An FRO is never required to release any flight that he or she feels uncomfortable with even if the flight is clearly releasable." OK I made that up but its true. Being an FRO does not obligate anyone to release a flight. Most FROs are reasonable folks and will release a flight that appears proper, but they have the right to refuse a release for any reason whatsoever.



The flight release is a key part of a safety chain that results in a safe and successful flight. It begins with all the preflight planning (this may be part of an ongoing mission), followed by the creation of a sortie, the filling in of the ORM, and the request for release. The responsibilities of the FRO are summarized in CAPR 70-1 paragraph 9.11.3.4.3 and are worth repeating:

9.11.3.4.3. The FRO is responsible for verifying appropriate information, authorizing a CAP pilot to fly as pilot in command in CAP aircraft, verifying use of the appropriate code from CAPS 75, Mission Symbols, and confirming that the aircraft has arrived safely at its destination. If not notified that the flight was safely concluded or extended, the FRO is responsible for initiating missing aircraft procedures at a time determined during release, but no later than two hours from estimated time of arrival. Except as indicated below, each flight release must be issued via the eFlight Release function in WMIRS.

As emphasized in the FRO training, the FRO is not a dispatcher. The FRO is not responsible for doing W&B, checking the weather, ordering fuel, or any of the other preflight operations. The FRO is responsible for ensuring the crew is qualified, a proper mission symbol sortie is being used, and the sortie has been properly entered into WMIRS (there are exceptions where the sortie can be entered after the fact, but this is uncommon). In a perfect world, an FRO would be unnecessary. There is nothing the FRO does that the PIC has not already done. What the FRO does provide is a cross check ensuring the PIC didn't miss anything.

Although not strictly their responsibility, an FRO may ask questions of the PIC if there is evidence of a lack of planning or judgement on the PIC's part. For example, if the PIC is requesting a sortie with an approaching line of thunderstorms, it would not be unreasonable for the FRO to start asking questions.

CAP has two levels of FROs: FRO and Senior FRO (SFRO). They are distinguished in part by what level of risk they can authorize for a release. These can change at any time but currently:

- Low - Scores between 0 and 14 may be approved by any Flight Release Officer.
- Med - Scores between 15 and 29 must be approved by a Senior Flight Release Officer.
- High - Scores between 30 and 59 must be approved by a Senior Flight Release Officer and the Wing CC, CV or DO.
- Extreme - Scores greater than or equal to 60 must be approved by a Senior Flight Release Officer, the Wing CC, CV or DO, and the CAP/DO or their designee through the NOC.

Another difference between an FRO and an SFRO is for releases involving IFR flight. An FRO can release an IFR flight if ceilings are no lower than 800' AGL and visibility no lower than 2 miles. An SFRO can release an IFR flight if ceilings are no lower than 500' AGL and visibility no lower than 1 mile. To go lower requires additional approvals.

An FRO can only release a flight where the runways for takeoff are longer than the sum of the calculated takeoff and landing distances given the prevailing conditions (aircraft actual takeoff weight and density altitude). For runways not meeting these criteria, only an SFRO can release the flight. Needless to say, no one should release a flight for takeoff on a runway that is shorter than the calculated takeoff roll!!!

If you are an FRO, remember you are an essential part of our quality and safety chain for air operations. Take your responsibility seriously. Keep in mind that if there is an accident or an incident, you will be asked to explain why you released the flight. There has been some disastrous fallout from faulty releases. Most notably, the victims of the crash were denied any insurance.

Safety First? Fugettaboutit!

Not too long ago in the aviation community you would hear that safety was "number 1" and that safety was paramount. Many of us in the GA community would repeat the myth that the most dangerous part of the trip was the drive to the airport. As experience would show however, there are inherent risks in flying and if we really believed safety was paramount we would stay on the ground. John and Martha King did a lot for GA when they started looking at safety from a risk perspective.

That's not to say safety is not important. It's critically important! But you can't be safe if you don't recognize the risks and take account of them. We have moved from a Safety First mentality to a Safety Culture mentality. One of the enablers of a safety culture is to realistically assess risk and figure out what you are going to do about it. Risk assessment should not only be done for every flight but at a higher level looking at the risks associated with overall operations. But for now, we will focus on dealing with risk for an individual flight.

A "risk" is usually defined as a future hazard that may impact the safety of the flight. For example, in any flight there is a risk of engine failure. We characterize a risk by its severity (how bad is it if it happens?) and its probability of occurrence. This helps us to filter out many risks as they are either very improbable or even if they happened, they would be easily handled. For any flight you can come up with an infinite list of risks. Volcanic eruption, earthquake, and zombie attacks are all risks with severe repercussions but the probability of it happening is close enough to zero as to ignore them. Other risks such as spilling your coffee on your lap, losing your iPad under your seat, or forgetting to call you mother before takeoff are more probable but can be handled without too much stress (spilling coffee could be an exception). But like anything else, assessing risk takes practice.

A good practice before any flight is to ask yourself (or your student, or your instructor, or your crew, or your passengers, or your mother) what are the top three risks for this particular flight. This forces a realistic assessment of risk. At a busy airport, the risks might include collision avoidance when there are lots of planes in the air. Or maybe there is a known squawk that might become a hazard in the wrong circumstances. Or maybe there is a gusty cross wind and so forth. The risks should be realistic, significant, and possible. Leave out the zombie attacks.

Recognizing risks is just the first step. Now what are you going to do about them? There are several ways to handle a risk.

- Avoid it – This can be as simple as cancelling the flight depending on the risk. But it can also mean taking on more fuel if fuel exhaustion is a risk or making a fuel stop. There are usually lots of options to avoid risk depending on the risk.
- Mitigate it – Perhaps we can't avoid it, but we can mitigate it. If turbulence is a risk perhaps, we can choose a different altitude. If traffic is a risk, insist on all eyes outside and use ADS-B traffic. Again, depending on the risk, there can be many mitigations.
- Accept it – Sometimes you can't do anything about the risk and just must accept it. You do this all the time when you go IFR or fly at night. Real risks are incurred that you accept.
- Transfer it – In some cases you can do the time-honored practice of sticking someone else with the risk. Students do this all the time when they get in a bad situation, and they hand control of the airplane to the instructor.
- Ignore it – Never, never, do this. This is the antithesis of safe flying.

Risk management is not a one-time event but is a continuous effort. Throughout the flight, evaluate and assess any new risks that come up and take the appropriate actions to mitigate the new items that pop-up. Post-flight, reflect on how you did at risk management. Did you do a good job of identifying the risks? Did you mitigate them, or could you have done better? Any lessons learned for the next flight?

Risk management is part science and part art. But like any discipline it takes practice and should be a team sport. Involve your crew and if appropriate, ATC.

Articles for the National Stan Eval Newsletter:
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