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NEWSLETTER

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SAFETYWIRE

Deviation Dissonance

(Source: James Williams; FAA Safety Briefing, September 05, 2024)

It was a dark night (although not stormy as many of these stories start) and I was taxiing out to the runway with an instructor friend. I think the goal of our flight was to extend our night currency for upcoming flights, but that part of the memory is lost due to the passage of time. What happened next though was not. That was burned sharply into my memory. We approached the runway, switched over to the tower frequency, and were quickly given our take-off clearance. We pulled onto the runway and slowly advanced the throttle. With the airspeed building, we saw a series of lights speeding from left to right across the runway. We immediately aborted the takeoff and slowed as we passed the taxiway where a plane was on its way to the ramp. We collected ourselves and taxied back for a second attempt, and luckily, completed an uneventful takeoff. The rest of the flight was unremarkable, but talking to the controller upon returning to the airport he mentioned that the airplane had been instructed to hold short of the runway and thanked us for using good judgment.

Through vigilance, a lot of hard work, and a bit of luck, we've worked our way to a profoundly safe system. But that safety is always only one misunderstanding or bit of confusion away from falling apart for any of us. I think that is where the above-mentioned dissonance comes in. How can our system be simultaneously so safe and filled with dangers? My flight was safe. Except for the brief moment that it wasn't. But that moment was almost immediately mitigated. That one runway incursion caused by a pilot deviation almost punched through several layers of safety.

To borrow another metaphor, our system is safe because it functions like an orchestra where everyone has a part to play, knows the song, and has sheet music in front of them. But even with all of that coordination who hasn't made a mistake? Any musician will tell you that mistakes happen. Just like my runway incursion experience, many are fleeting and minor annoyances. But some bad notes can disrupt the whole symphony.

A Runway Incursion by Any Other Name …

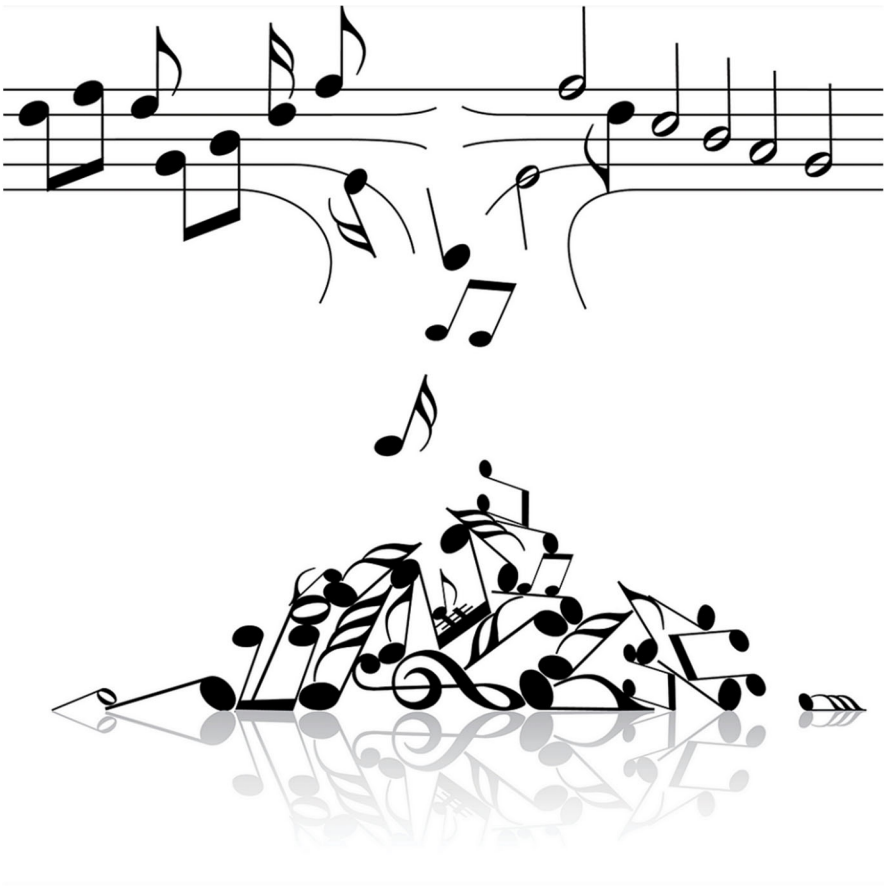
The technical definition of a runway incursion (RI) is any occurrence at an aerodrome involving the incorrect presence of an aircraft, vehicle, or person on the protected area of a surface designated for the landing and take-off of aircraft. While all incursions are covered by this definition, they are by no means all the same. The least severe is a category D which is an incursion that meets the definition such as the incorrect presence of a single vehicle/person/aircraft on the protected area of a surface designated for the landing and take-off of aircraft but with no immediate safety consequences. Category C is an incursion where there is ample time or distance to avoid a collision. Category B is an incident where separation decreases and there is significant potential for a collision which may result in a time-critical corrective/evasive response to avoid a collision. The most serious is category A in which a collision is narrowly avoided. And of course, above that is an accident where a collision takes place. But because those accidents are thankfully rare, we focus on runway incursions to track trends and develop mitigations to events that almost became accidents so we can prevent the preconditions for such accidents. My personal experience with an RI is probably either a category C or B. We took immediate action, but the night conditions probably made the danger seem closer than it really was.

We group runway incursions into three source categories: operational incidents, vehicle/pedestrian deviations, and pilot deviations. Operational incidents are runway incursions that are the results of an error by air traffic control (ATC) and vehicle/pedestrian deviations are when a vehicle or person enters the airport movement areas without permission from ATC. A pilot deviation (PD) is any action of a pilot that violates any Federal Aviation Regulation but, in this case, we are talking more specifically about deviations around the runway (e.g. crossing a runway without permission). In this article, we are focusing on those PDs for a couple of reasons. First, as pilots, that is the one we generally have the most control over, and second because they make up the majority of RIs, more than 60% in recent years.

Despite efforts to decrease RIs, the numbers remain stubbornly static. Let's look at how we can bring this number down.

Not Playing by Ear

While improvisation is often lauded in jazz, I think a symphony orchestra is a better analogy for the National Airspace System (NAS). The NAS requires each player to know their part and what to expect from all the other players. As a high school quality musician who played jazz, orchestral, and marching band music through the years, I appreciate playing by ear. But when it counts, a well-coordinated structure is the name of the game.



The first thing you can do is to rehearse. You don't have sheet music to work from but that doesn't mean you don't have sheets. Airport diagrams are freely available from the FAA if you don't have access to them elsewhere (faa.gov/airports/runway_safety/diagrams). You can download these PDFs to your phone or tablet for any airport you might be planning to visit and preplan your visit by tracing the routes you could be assigned upon arrival. And of course, it wouldn't be one of my articles without a plug for the use of PC simulation to conduct a virtual rehearsal.

Another great resource is the ever-growing list of *From the Flight Deck* (FTFD) videos on the FAA's YouTube channel. These videos document general issues facing pilots in addition to airport-specific guidance. All of this is presented, as the name suggests, from the flight deck of a general aviation airplane. For more on the FTFD videos please see the article, "A Front Seat View of Runway Safety."

In the vein of preventative measures, there is also a FAASTeam course on pilot deviations. This course is normally assigned to pilots as part of the Compliance Program after a pilot deviation, but it is available to all pilots on FAASafety.gov. It's good information even if it's not "required." For more on the course, see my Checklist department in this issue.

Leveraging Your "Instrument"

While I was never a musician who could truly take advantage of a higher-quality instrument, I did see its benefits. In aviation, higher-quality instruments were more accessible but still required skill to get the most out of them. The proliferation of modern glass cockpits and widely available tablet-based Electronic Flight Bags (EFB) is a massive upgrade in terms of situational awareness in all phases of flight. But this is especially true in the airport environment where modern systems can superimpose your position on charts and airport diagrams. Some will even let you enter your taxi instructions as part of the flight plan. Of course, knowing how to use all this technology is critical so that you can keep your head up and your eyes outside the cockpit for the most part. When you leave the ramp is not the time to be figuring things out.

Additionally, before boarding the aircraft, it is important to brief any passengers, including other rated pilots, regarding sterile cockpit procedures. Extra sets of eyes can be useful, but distractions are a common cause of PDs.

Following the Conductor

Every orchestra needs a conductor to oversee and keep time in the performance. ATC acts as the conductor at an airport, calling the tune and adjusting the performance as needed. But unlike an orchestra conductor, ATC has more than just a baton. In fact, the FAA is always looking for more and better tools to assist controllers. For a deeper look at some of those new tools please see the article "Striving for a Safer Surface" in this issue.

While you are working your hardest to nail your part, it's important to listen to the conductor. When in doubt, ask. Read back the critical information rather than simply replying "roger" or just your callsign. That snappy reply may be writing a check you'd rather not cash. If you can't comply with an instruction like an intersection departure or a specific turn-off at landing, let the controller know. Don't try to comply unless you are reasonably sure of success. The conductor is likely making other decisions predicated on your ability to hit that "note" so it's better to be clear with them if you can't. If you are not sure what to do regarding the ATC clearance/instruction, stop and ask ATC to repeat.

You don't become a world-class musician overnight and we won't eliminate PDs overnight either. But if we all work together, we can move closer to that perfect symphony we're aspiring to.

The Keys to Rotorcraft Runway Safety: Training, Education, & Experience

(Source: Gene Trainor; FAA Safety Briefing, September 03, 2024)

When thinking about runway safety, most people probably focus on fixed-wing aircraft. With so many helicopter businesses and operations at or near airports, rotorcraft pilots and operators also play a role in runway safety.

When it comes to rotorcraft operations, the FAA has focused on preparing student helicopter pilots to responsibly navigate the often-busy airport environment. Areas of key importance include experience, training, and education, which help pilots learn how to spot hazards quickly and accurately.

Experience matters and the data backs that up. According to the FAA *Helicopter Flying Handbook*, accident rates decrease by nearly 50% once a pilot obtains 100 hours and continue to decrease until the 1,000-hour level. Despite this downward trend, the helicopter accident rate is still 30% higher than the accident rate for fixed-wing aircraft, the handbook also states.

Education and training are key as pilots gain experience. Here are some helpful recommendations from the FAA Helicopter Instructor's Handbook and other FAA publications to keep in mind for rotorcraft (and fixed-wing) pilots:

- Learn the airport's traffic patterns and flight procedures (many airports have facility guides). Be aware of your helicopter's position and the position of other aircraft and obstructions. Even though helicopters do not regularly use runways for takeoffs and landings, runway incursions need to be understood and discussed.

- Typically, helicopters fly lower at airports than fixed-wing aircraft. The average traffic pattern altitude is 500–800 feet above ground level (AGL) for helicopters, while for most fixed-wing aircraft it is 1,000–1,500 feet AGL. Listen attentively to any clearances and instructions from air traffic control (ATC) and acknowledge them in full.

- Blowing dust, sand, or rocks caused by the helicopter's rotor wash can be hazardous. Take whatever actions that you can when landing and taking off to prevent creating these hazards.

- In forward flight, departing or landing helicopters produce a pair of strong, high-speed trailing vortices similar to wing tip vortices of larger fixed-wing aircraft. Pilots of small aircraft should use caution when operating behind or crossing behind landing and departing helicopters.

- To mitigate risks, the FAA urges pilots to wait several minutes for the turbulence to dissipate or maintain a safe distance from the rotor downwash. How long you should wait depends on wind conditions and the terrain. A rule of thumb in the aviation community is to wait at least two minutes or keep a distance of three nautical miles.

- FAA guidelines recommend that pilots of aircraft weighing 41,000 pounds or less, which covers most helicopters and small planes, avoid operating within three main rotor diameters of any helicopter operating in a slow hover taxi or a stationary hover.

- Be aware of both main and tail rotors on the ground. The potential of someone walking into turning rotors is significant. The tail rotor, in particular, is hard to notice.

- Pay attention to any wind indicators, such as windsocks, flags, and smoke.

Before flying, Colorado flight instructor and pilot Jessica Meiris said she considers whether the airport is controlled or uncontrolled, how much traffic she can expect, her mission, and type of helicopter she's flying.

"Generally speaking, I gather weather information like ATIS or ASOS to plan for approach direction and begin communications — either clear position reports or contacting ATC — early enough to allow for a change in specific landing site or diversion if needed," she said. "I'm also conscious about helicopter wake turbulence and how my flight path might affect other aircraft in the pattern or on the ground. Remember, larger helicopters generate bigger and more dangerous vortices."

"If I'm landing direct to a ramp, I scan the area and choose a site that is clear of debris, obstacles, and other aircraft if possible. As I approach the intended landing zone, I keep scanning the immediate as well as the general area for obstacles in case I need to respond to an emergency or go around, so I always have an escape. Takeoff protocols are similar — maintaining situational awareness, communicating clearly, and being mindful of the impact my actions have on others."

Meiris noted that safety is a team effort. "How you fly out there reflects on the entire industry," she said. "Let's operate in a way that leaves others with the impression that helicopters are safe, considerate, and resourceful machines."

NTSB Safety Alerts Emphasize Proper Use of Aircraft Deicing Systems

(Source: Gordon Gilbert; Aviation International News, September 11, 2024)

With the winter months just around the corner in the Northern Hemisphere, the NTSB has published Safety Alert SA-097 to remind operators of the risks of flying in icing conditions, including the adverse effects of airframe and propeller icing on aircraft performance.

“As little as one-quarter inch of wing leading-edge ice accumulation can increase the stall speed by 25 to 40 knots and cause sudden departure from controlled fight,” warns the NTSB. In addition, ice accumulation on pitot tubes can cause flight instruments—particularly airspeed, altimeter, and vertical speed indicators—to stop functioning or give incorrect readings.

The notice concedes that some pilots have been taught to wait for a prescribed accumulation of leading-edge ice before activating deice boots because of the threat of ice bridging. “However, performance degradation could develop if the deice boots are not activated as soon as icing is encountered.” The notice also cautions that continuous use of the autopilot in icing conditions can “deprive the pilot of the opportunity to detect the buildup of ice on the airframe through changes in longitudinal trim requirements and control forces.”

The fatal crash of an Embraer Phenom 100 on Dec. 8, 2014, was one of several icing accidents cited in the notice where the NTSB said pilots “did not adequately comply” with instructions in their pilot operating handbooks or aircraft flight manuals leading to in-flight loss of control. While descending from 23,000 feet, the Phenom 100 pilot confirmed to ATC that he had the destination airport’s current weather observation that indicated conditions favorable for structural icing during descent and approach. About three-quarters of a mile from the approach end of the runway, the twinjet stalled and collided with three houses. The pilot, both passengers, and three people in one of the houses were killed.

Before beginning the descent, “the pilot incorrectly used the normal (non-icing) checklist, which did not call for activating the wing and horizontal stabilizer deice system,” the Safety Alert says. “Further, he set the landing reference speed at 92 knots rather than 126 knots he should have used to account for the icing conditions.”

It concludes: “Had the pilot used the correct checklist…the airframe likely would not have accumulated ice, and the pilot would have used appropriate landing performance speeds for the conditions. Thus, not using the correct checklist led to an aerodynamic stall at an altitude at which recovery was not possible.”

SAFETY MANAGER'S CORNER

Safety Policy Annual Review

Your aviation operation's safety policy exists as a direct message from top management to every employee, clearly defining the organization's safety posture and the expectations of every employee. It demonstrates commitment to safety and defines it as a core value, equal to production and quality. By demanding safe work practices and decision making from every employee, the policy message describes egalitarian responsibility.

A safety policy reflecting a safety management system does not stop at safe practices, however. It must also emphasize the importance of active participation and communication. An employee exhibiting safe work practices quite simply falls short of risk management requirements. Think about tool control as a specific example. A maintenance technician could complete 298 work shifts without losing a tool, but on shift 299 he discovers one missing from his toolbox at the end of the work shift. Although it was quickly located next to the tire of the most recent aircraft worked on, the risk remains and must be communicated. Did the technician exhibit safe work practices? Yes. Were the practices perfect? No. Should this situation be communicated via a safety reporting mechanism? A resounding YES!

What's necessary for the above technician to feel not only compelled, but comfortable enough to report the "near miss?" It's mostly referred to as a "Just Culture." A just culture is a topic that could fill volumes, but let's suffice it to say it's simply requires two things: a promise of confidentiality and protection from punishment when behavior is acceptable yet unintentional errors occur. This message must be unconditionally communicated in the safety policy, otherwise employees detect a lack of commitment from top management.

Just as an operation is dynamic and ever changing, so too is the safety policy. That may sound surprising, but it really shouldn't. Much changes in aviation operations over even short periods of time. Changes include both the physical (people, aircraft, hangars, airport, etc.) and the intangible (attitudes, motivations, morale, business environment, etc.) and the safety policy must adapt to these changes. If safety reporting has fallen off, a revised policy emphasizing communication and just culture should be a consideration. Every employee understands this concept to some extent, and the four year old crusty, yellowing safety policy projects a message as well, albeit negative.

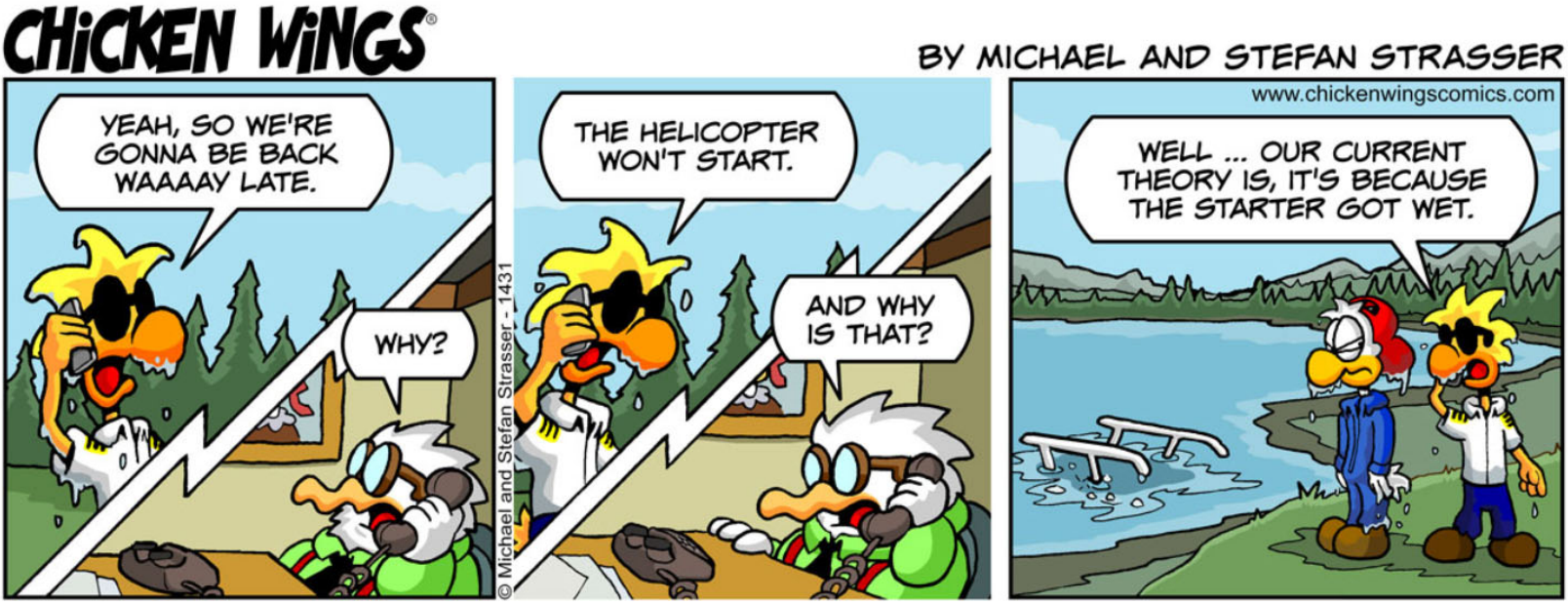
A safety policy is an essential communication tool. Review it frequently to ensure its communication hits the mark.

Quote of the Month

The most effective way to do it is to just do it

BY: Amelia Earhart

In every aspect of SMS, it is critical to look beyond the obvious and look in to the details. Investigate the issue thoroughly. A complete and accurate root cause can be completed more effectively when a detailed investigation is completed. It is critical to develop the best possible corrective action to reduce the risk as much as possible, and a detailed root caused analysis can help.



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