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SAFETYWIRE

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Inadvertent IMC (IIMC), the Ongoing Threat

(**Source:** Woody McClendon, US Sales Manager, Loft Dynamics, USHST Winter 2025 Newsletter)

In Several times in my long flying career I have flown into weather I hadn't planned on. The discomfort, and fear of each of these varied. The least intrusive was in a King Air 200 one night. The weather was described as marginal VFR. As always I was on an IFR flight plan, and the weather was well above the minimums prescribed for the route. I was hand flying the airplane because the airplane was quite old, and the altitude capture didn't seem to work. On the descent I could see the airport out ahead, then suddenly couldn't. We had flown into a drifting batch of clouds.

Without a thought I got on instruments, which, for the most part I was already referring to during the descent. I had completed a recurrent course about a month prior and flown a few hours on instruments in the past week or so, thus the transition was routine. I intercepted the ILS, flew the approach down to about 500 feet and landed. IIMC, certainly by definition, but uneventful because I was instrument trained and current, and I was in an aircraft that was well equipped for it.

The other end of the terror spectrum happened with a helicopter flight in the mountains of Arizona at three AM. Reporting in for a night shift I had noticed a high overcast on the drive, and it looked like there was weather building up around us. Once in the office, the weather on the pilot office computer showed a batch of rain was moving in from the Gulf of Mexico. That guaranteed the mountains later that night would be obscured. As we often did in those days I avoided talking to the nurses about weather. They only cared about getting to their patient. It was the pilot's problem how to get them there.

About two AM we got a call for a trauma patient about eighty miles northeast of Phoenix. He was horribly injured from crashing his truck into a tree. We had the usual tense dialogue, the nurses pushing to go while I pointed out the weather and the potential danger. The compromise in those days was 'Why don't we try it. We can always turn back.' The truth was, we never turned back, no matter how badly the weather deteriorated. Knowing I would soon be scud running across rising, dark terrain, we set off, the nurses chatting happily while I had visions of flying into the soggy clouds and trying to survive.

We made it to the LZ deep in a mountain forest and landed on a narrow country road. As we landed I could see the clouds were only a few hundred feet above us. And it was raining. I sat in the helicopter, thinking about the jam I had gotten us into. Sure enough, as we lifted off and climbed out of the trees the clouds were now almost down to the tops of the trees. I turned to our heading to Phoenix, then suddenly we were in the clouds. We couldn't turn back. The ambulance had signed off the radio and left the LZ. I had to figure out how to stay right side up.

I took a few deep breaths and locked on to the little attitude indicator, then began a scan that was spotty and scattered. I hadn't flown instruments in years. Our annual training and checkride was one hour flight time and included one ILS with a pair of foggles supposedly blocking the outside view. But they didn't. Foggles are designed for airplanes where the view downward is nothing but airplane cabin. In a helicopter you had a clear view of the ground through the chin windows. It was a sham exercise designed to allow our employers to check a box on the training form.

But now I was stuck, either fly until we could got clear of clouds or ….

First thing I did was not move the cyclic. It's current position had us in level flight. If I didn't move it, theoretically we would remain in level flight. But we were being blown around by gusts of wind while rain pounded on the windshield. I corrected for the first lurch to the right, then back to center. We rolled off to the left and the nose drifted to the right, or so the heading and attitude indicators showed. I overcorrected, then remembered I needed to center the ball, or the helicopter would never fly right. A quick touch of the pedals brought the ball more or less to the center then I immediately returned to the attitude indicator, the airspeed indicator and the altimeter.

The next gyration from the turbulence showed up on the attitude indicator. I caressed in a touch of corrective roll and pitch. Miraculously it showed level, and the heading indicator quit turning I froze the cyclic movement right there. As the seconds rolled by I got better at it and the gyrations settled down to minor deviations.

The intercom was quiet. From my silence the nurses sensed we were in trouble and were watching my every move. I didn't care. My whole life's focus was on these 1940-vintage instruments, every second another challenge to stay right side up. But every second also took us closer to descending out of the clouds and escaping the mountains. We flew for about fifteen minutes. It seemed like an hour, but then we began to see the lights of Phoenix through the rain and mist. Then we flew out of the clouds. The city spread out across the horizon. No one said anything for a while, then the nurses got busy prepping their patient for his transfer to a gurney at the hospital ER helipad.

Later, when we were back at our base quarters I felt we needed to clear the air about our dangerous escapade. We managed it, vowing that none of us would ever be a part of pushing the weather to save a patient. Would they actually listen to the next pilot they faced weather with? Not likely. Their mind set was always to get to the patient.

The atmosphere in the air medical community today is much more supportive of logical decision making, everyone on the team dedicated to making safe choices. The accident rates show that practice is working. Still, pilots are too often faced with pushing highly unstable helicopters equipped with light airplane instruments into murky skies. Their training is much improved, employers now giving pilots basic instrument skills. And more and more helicopters are equipped with autopilots. These crews have at least a fighting chance out in dark skies in remote terrain where there is no weather reporting, giving the pilot the mental space and security to plan a route to safe skies.

As well there is a steady trend to transition to twin-engine helicopters with full avionic suites and pilots with a full set of instrument flying skills, like the rest of the world in aviation. IIMC will remain a constant threat until that transition is complete.

U.S. Runway Incursions Drive New Safety Push- Controllers, pilots, tech all factor in

(Source: Amy Wilder, AIN, May 1, 2025)

The incursion at Chicago's Midway Airport where a Southwest Airlines Boeing 737 crew initiated a go-around when a corporate jet taxied across the active runway. © Screenshot/StreamTime Live

Recent runway incursions and near-collisions have reignited urgent discussions about surface safety at U.S. airports, with regulators, industry groups, and manufacturers calling for new technologies and procedures to address what the NTSB has called a critical risk.

According to FAA data, the number of reported U.S. runway incursions—defined as the incorrect presence of an aircraft, vehicle, or person on the protected area of a surface designated for landing and takeoff—has hovered around 1,700 annually for the past six years. In 2024, the agency recorded 1,758 incursions, nearly matching 2023's total of 1,760 and continuing an upward trend from a pandemic-era dip in 2020 and 2021.

Although most incidents fall under Category C or D (ample time/distance to avoid a collision or no immediate safety impact), a growing number of high-profile Category A and B events—where a collision was narrowly avoided or risked—have captured national attention. These include close calls at New York John F. Kennedy (KJFK), Texas' Austin-Bergstrom (KAUS), and Ronald Reagan Washington National Airport (KDCA).

A Crowded Environment

Each day, U.S. air traffic controllers handle approximately 45,000 flights—more than 16 million a year. With the steady rebound of travel post-pandemic, flight volumes are back to pre-2020 levels. Busy commercial hubs such as in Atlanta (KATL), Los Angeles (KLAX), Dallas-Fort Worth (KDFW), Denver (KDEN), and Chicago (KORD) see the highest volumes, but not all incursions happen at the busiest airports.

FAA data shows that pilot deviations are the primary source of incursions, accounting for roughly two-thirds of events. The remaining are split between air traffic controller operational errors and vehicle or pedestrian deviations.

As defined by the FAA, runway incursions are categorized by severity:

Category A: Serious incident; collision narrowly avoided.

Category B: Significant potential for collision.

Category C: Sufficient time/distance to avoid collision.

Category D: No immediate safety consequences.

(Surface incidents, distinct from runway incursions, involve unauthorized movement on the airfield that affects safety but does not occur in the designated runway protection area.)

Over the past 25 years, the U.S. has seen fluctuations in runway incursions, reflecting both challenges and advancements in aviation safety. In 2002, there were 987 reported runway incursions. By 2024, this number had risen to 1,757 (this number could still change as final reports are issued and causes assigned for incidents and accidents currently under investigation).

It's important to note that while the total number of incursions has increased, the most serious incidents—those classified as Categories A and B—have shown a decrease over the past two decades. For instance, in 2022, there were 18 serious runway incursions, down from a high of 32 in 2007.

Several high-profile incidents have underscored the importance of runway safety. In June 1999, American Airlines Flight 1420 overran the runway upon landing in Little Rock, Arkansas, resulting in 11 fatalities. More recently, in February 2025, a Southwest Airlines flight at Chicago's Midway Airport had to abruptly ascend to avoid a smaller jet crossing its runway.

Close Calls, Renewed Calls for Action

Among the most serious recent events was a February 2023 incursion in Austin involving a FedEx Boeing 767 on approach and a Southwest 737. Poor visibility prevented air traffic control from seeing the aircraft on the runway, and the FedEx crew initiated a missed approach just in time to avoid collision. The incident reignited calls for better surface detection systems in towers and alerting systems in cockpits.

NTSB board member Michael Graham, speaking at the 2024 Bombardier Safety Standdown, emphasized the importance of procedural discipline and surface awareness. He cited incidents at JFK and Austin as examples of what he called “clear opportunities for cockpit-based runway alerting systems.”

“Since 2000, we’ve been asking for surface detection in towers and alerting systems in the cockpit,” said Graham. “We now have technology that can help, and it’s time to implement it widely.”

The FAA and Industry Respond

In 2024, the FAA released its National Runway Safety Plan 2024–2026, outlining risk-based strategies to reduce surface events. The plan emphasizes collaboration with airport operators, pilots, and manufacturers and aligns with the agency’s safety risk management principles.

In March 2025, the agency convened a General and Business Aviation Safety Call to Action to address runway incursions and other safety issues. Immediate outcomes included increased outreach on phraseology, operations around Class B airspace, and reminders for pilots to use checklists and verify notams. The FAA also committed to analyzing mixed IFR/VFR airspace encounters and expanding tracking technologies in control towers.

At the same time, the U.S. DOT Office of Inspector General released an audit critical of the FAA’s fragmented data-sharing processes, calling for better integration across systems and follow-through on initiatives like the “Technology Sprint.” The FAA has allocated more than $200 million to runway incursion mitigation programs.

Technology in the Tower and Cockpit

The FAA has begun deploying new surveillance tools, including:

- Surface Awareness Initiative (SAI): This offers real-time situational awareness to controllers. It is now operational at airports, including Indianapolis and Austin, with more expected by the end of 2025.
- uAvionix FlightLine: Displays aircraft and vehicle movements via ADS-B signals on detailed airport maps.
- Collins Aerospace STARS ARV: Alerts controllers when an aircraft lines up on the wrong surface or approaches a closed runway.

In the cockpit, manufacturers such as Garmin, Honeywell, and Collins Aerospace are introducing enhanced surface alert systems. Garmin’s SafeTaxi overlays hold-short lines and hotspot indicators on geo-referenced airport diagrams. Honeywell’s Surf-A and Surf-IA systems, using GPS and ADS-B, issue real-time aural and visual alerts of potential conflicts during takeoff or taxi.

These systems offer pilots improved situational awareness and, according to NTSB investigators, could prevent accidents by alerting crews seconds earlier than ATC in some cases.

Amanda Ferraro, CEO of Aviation Safety Solutions at Bombardier Safety Standdown 2025

Recommendations and Next Steps

The NTSB has issued more than a dozen safety recommendations to the FAA in 2024 alone, calling for:

- Cockpit-based verbal callouts before crossing runways
- Better SOPs for managing distractions during taxi
- Flight deck alerting systems for surface hazards
- Mandatory installation of 25-hour cockpit voice recorders
- Expanded deployment of surface surveillance systems

Notably, safety recommendations A-24-4 through A-24-6 call for FAA collaboration with OEMs to develop and mandate cockpit-based surface alerting technologies in both new and existing aircraft.

The FAA has concurred with all recommendations but has yet to implement many of them. Progress has been made on CVR retrofits, thanks to congressional mandates.

Culture and Communication

Beyond technology, safety experts emphasize procedural rigor and clear communication. At the Safety Standdown, Aviation Safety Solutions CEO Amanda Ferraro presented a case study where a lack of internal documentation led to FAA scrutiny and potential violations. “It’s not about blame. It’s about asking, ‘How do we ensure this never happens again?’” she said.

General Aviation Joint Safety Committee (GAJSC) member Jens Hennig echoed that point, praising the FAA’s "From the Flight Deck" video series as a vital resource for pilots unfamiliar with complex airport layouts. “There’s nothing like seeing it visually before you go,” he said.

GAJSC studies also found that most wrong-surface events stem from distraction, inexperience, and expectation bias. “It’s not just pilot error—it’s an opportunity to improve planning, training, and awareness,” the group noted.

The Road Ahead

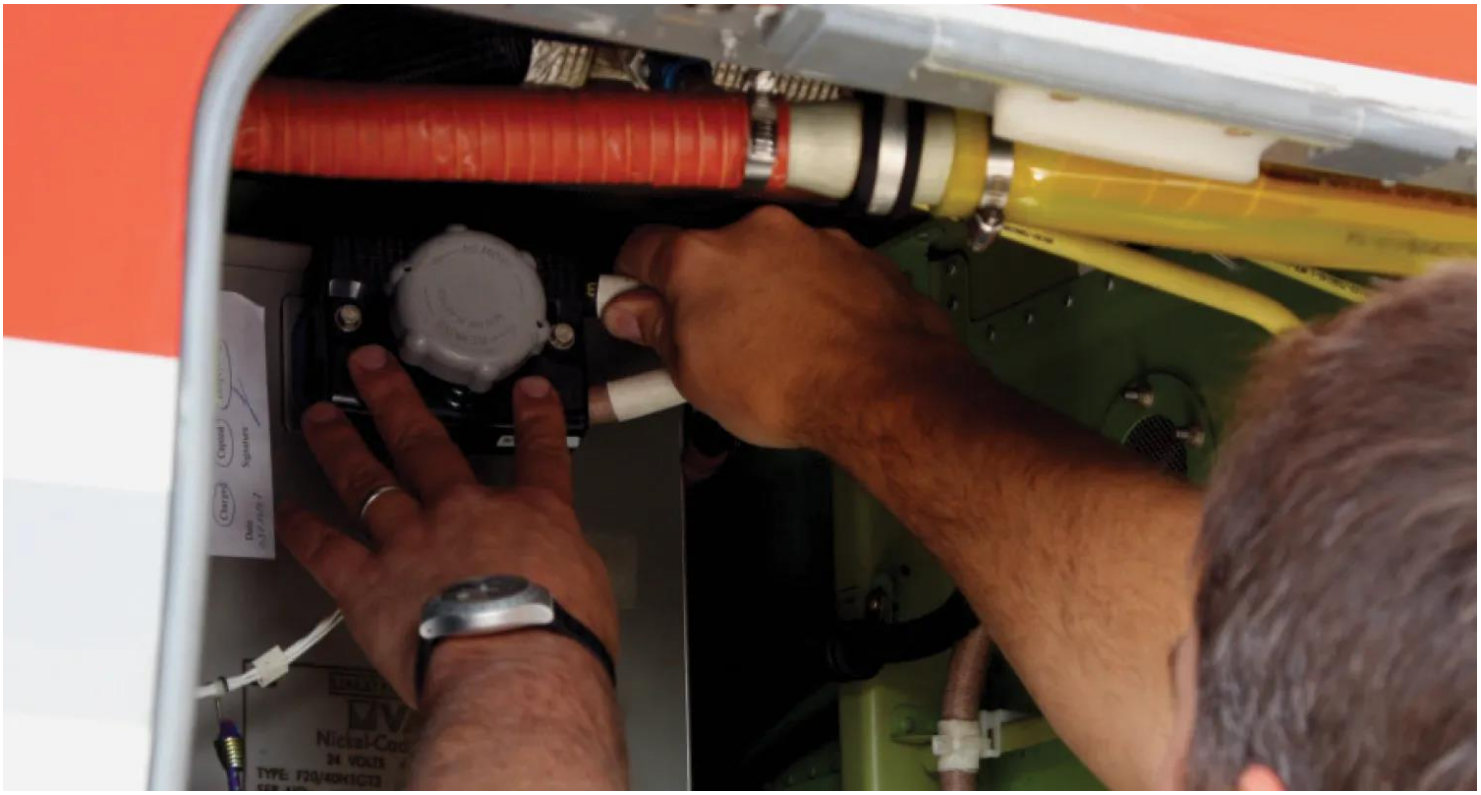
Efforts to reduce runway incursions are accelerating across the industry. But, with nearly 1,700 incursions annually and a steady stream of close calls, the consensus among regulators, manufacturers, and operators is clear: more must be done.

As the NTSB’s Graham emphasized, “The potential is always there. Vigilance, procedures, and technology together are our best defense.”

The Care and Keeping of Batteries

(Source: Rebekah Waters, FAA Safety Briefing Magazine, May 2, 2025)

Batteries are an important part of any aircraft. They provide the initial power needed to start the engine, energize critical systems, and keep everything functioning. The primary role of the battery is to provide a reserve of electrical power in case the alternator fails, allowing pilots to navigate, communicate, and get the aircraft back on the ground safely. If the battery is weak or neglected, the whole system struggles — starting the engine becomes unreliable, avionics may fail, and safety is compromised. Regular maintenance keeps both the battery and the engine in top shape, ensuring smooth operation when it matters most.



Battery types vary. Most small private aircraft use lead-acid batteries, while most commercial and military aircraft use NiCad batteries. However, other types are becoming available, such as gel cell and sealed lead-acid batteries. The battery best suited for a particular application will depend on the relative importance of several characteristics, such as weight, cost, volume, service or shelf life, discharge rate, maintenance, and charging rate. Any change of battery type must comply with the aircraft's type certification basis and may be considered a major alteration to the aircraft. To ensure safety and reliability, it's essential to update the aircraft's instructions for continued airworthiness (ICA) to include maintenance and inspection requirements specific to the new battery type.

Regular inspection and maintenance of aircraft batteries is crucial to ensure optimal performance and safety. Mechanics should conduct routine checks for physical damage, electrolyte levels, and signs of corrosion. Regularly inspect and clean battery terminals and keep them free from corrosion to ensure proper electrical contact. Poor connections can lead to several potentially dangerous issues, including increased electrical resistance, battery drainage, system malfunctions, overheating, and potential fire hazards. Always follow manufacturer-recommended charging procedures. Overcharging or deep discharging batteries can significantly reduce their lifespan. A good charger has the option to select the type of battery you are charging, which helps protect the battery.

Proper storage of aircraft batteries is crucial to maintain their functionality and extend service life. Store batteries in a dry, temperature-controlled environment. Extreme temperatures can degrade battery performance and shorten lifespan. Maintain batteries at an appropriate state of charge during storage. For lead-acid batteries, this typically means keeping them fully charged to prevent sulfation. Perform regular checks during storage to monitor voltage health and recharge as necessary to maintain optimal charge levels.

Even with proper maintenance and storage, there comes a time when batteries must be replaced. Several factors, including capacity degradation, physical damage, manufacturer's service life limits, and safety concerns, can lead to the decision to remove and dispose of an aircraft battery. When this happens, proper disposal is crucial to ensure safety and compliance. Follow all federal and state regulations regarding hazardous materials.

Aviation mechanics who follow good maintenance and storage practices significantly enhance the safety, reliability, and lifespan of aircraft batteries, which in turn contributes to overall flight safety! To find out more about battery care, see the resources listed below.

Learn More

Aviation Maintenance Technician Handbook — Airframe, Chapter 9

AC 43.13–1B, *Acceptable Methods, Techniques, and Practices — Aircraft Inspection and Repair*

Rebekah Waters is an FAA Safety Briefing associate editor. She is a technical writer-editor in the FAA's Flight Standards Service.

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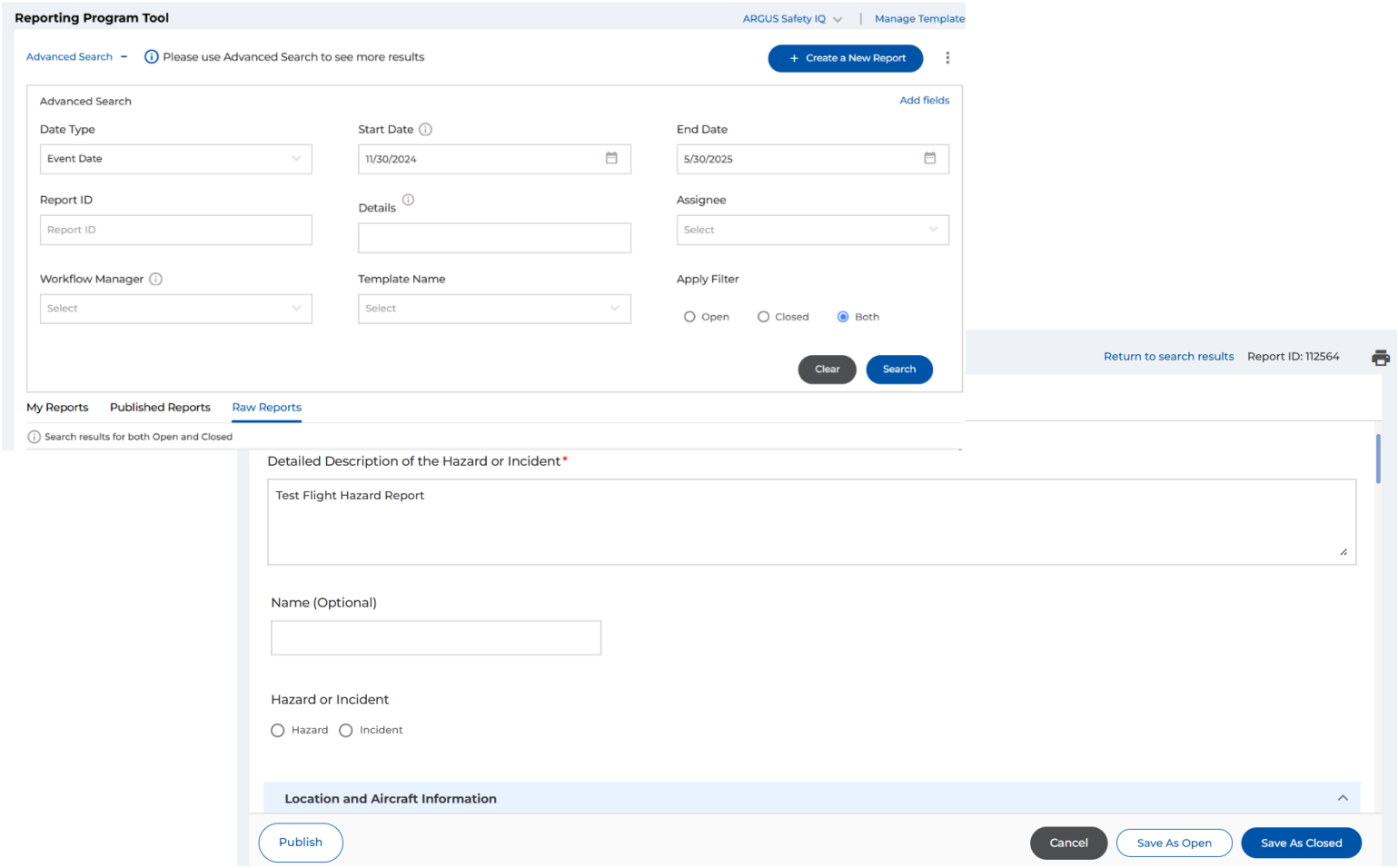
https://www.faa.gov/safety_briefing

SAFETY MANAGER'S CORNER

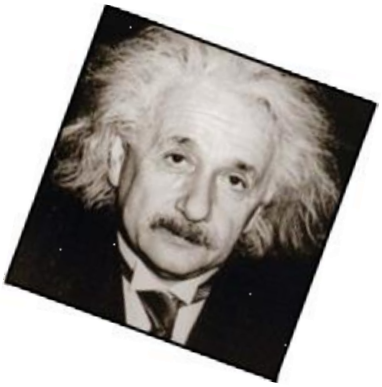
PRISM SMS: Return to Search Results

A new feature was recently added to PRISM SMS where users can now return to their previous search results after viewing a report. Users will see this new Return to Search Results feature any time they use the Advanced Search option in any of the tools in PRISM SMS.

This feature significantly improves the user experience when using the Advanced Search since they will no longer have to re-enter their search criteria after viewing each report. Now when a user inputs their search criteria from the Advanced Search and views/opens a report from the search results they will see a Return to Search Results button at the top right-hand side of the page (see screenshot). Users can also click Cancel or Save on the report and it will return them to their search results.



Quote of the Month

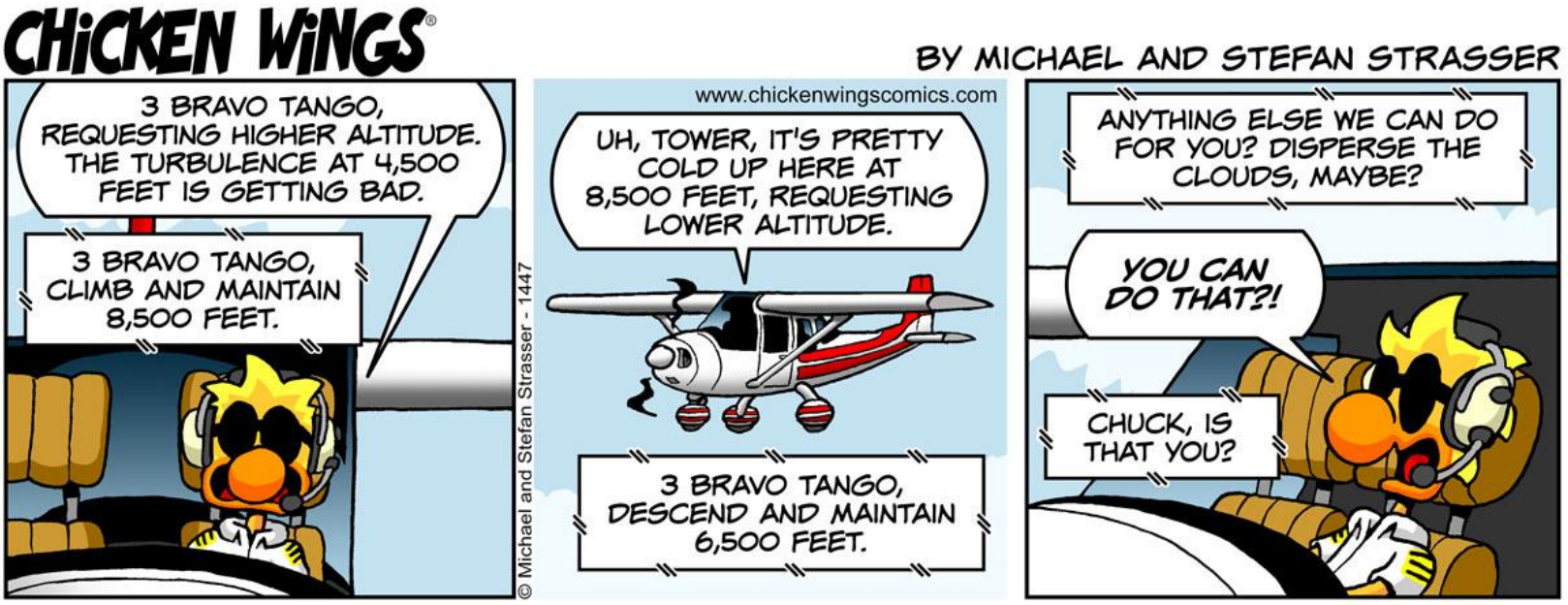


Not everything that counts can be counted, and not everything that can be counted counts.

BY: Albert Einstein

Living in today's world means overexposure to data. Data breaches, credit card information stolen, voter registration, ethnic and racial demographics, iPhone versus Android sales, Facebook likes, Twitter followers and on and on. More numbers and data than anyone can possibly digest in a meaningful way. How do people feel, what are their perceptions, what is their level of satisfaction? Think about how important those things are and ask yourself if the answer to those questions attracts the same level of attention all that data does? That's not meant to suggest we sit around all day and discuss how we all feel, but rather to tune in and be aware of how people feel affects their ability to perform work tasks. Humans are the most complex living beings on the planet Earth and are greatly influenced by external factors. Ignoring that reality and letting data, reports and counting assume the primary role driving operations is simply ignoring what counts.

On Short Final…



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