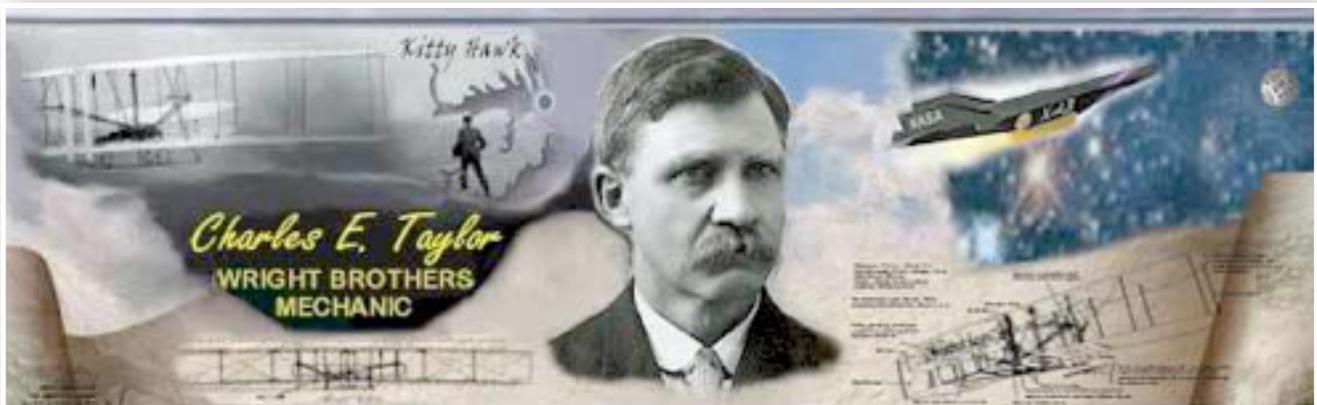


Aviation Human Factors Industry News

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From the sands of Kitty Hawk, the tradition lives on.

Hello all,

To subscribe send an email to: rhughes@humanfactorsedu.com

In this weeks edition of *Aviation Human Factors Industry News* you will read the following stories:

★Lost Information, Unaddressed Issues and More Failures of the NTSC Final Lion Air Flight 610 Report

★When Do Whistleblower Protections Apply

★Pilots who fly your holiday packages want the same rest rules as the pilots who fly you to grandma's

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★FAA Releases Go/No-go Medications List

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★You Never Roam Alone

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Lost Information, Unaddressed Issues and More Failures of the NTSC Final Lion Air Flight 610 Report

Episode 9

The Indonesian National Transportation Safety Committee (NTSC) has released its [final report](#) regarding the crash of Lion Air Flight 610 and John and Greg are far from satisfied. One thing is clear to these aviation experts: the focus was on returning the plane over and over again to revenue service, [rather than fixing known issues](#).

In this episode, John and Greg focus on [critical maintenance issues](#), some of which are presented as little more than footnotes in the NTSC final report. They find that the report presents selectively filtered information and lacks analysis, falling far short of providing much-needed answers. They apply their expertise to analyze critical failures.

Lion Air Flight 610 was a scheduled domestic flight operated by the Indonesian airline Lion Air from Soekarno–Hatta International Airport in Jakarta to Depati Amir Airport in Pangkal Pinang. On October 29, 2018, the Boeing 737 MAX 8 operating the route crashed into the Java Sea 13 minutes after takeoff, killing all 189 passengers and crew.



<https://www.flightsafetydetectives.com/e/lost-information-unaddressed-issues-and-more-failures-of-the-ntsc-final-lion-air-flight-610-report/>

<https://www.pama.org/knkt-report.html#/>

This Office of Special Counsel is an independent federal agency whose main mission is protecting “federal employees and applicants from prohibited personnel practices, especially reprisal for whistleblowing.” FAA employees can file complaints with OSC but they are not required to. [The FAA maintains an employee hotline](#) for reporting violations of its regulations, conduct that poses a “high level of risk to aviation safety” and “gross misconduct” by agency employees involving aviation safety. Both the OSC and FAA provide for confidentiality if requested. Not all complaints are entitled to whistleblower protections, so it’s important to do some research before filing a complaint. The DOT Office of Inspector General’s website has an overview of whistleblower protections applicable to DOT employees and its contractors. Complaints can also be filed via the DOT OIG’s hotline.

EMPLOYEE PROTECTIONS

In addition to protections afforded federal employees and federal contractors, [some aviation employees are also entitled to protections](#) under federal law. (Some states may also have protection laws, but those protections will vary from state to state.) Employees entitled to federal protections under the Wendell H. Ford Aviation Investment and Reform Act for the 21st Century—more succinctly referred to as AIR21—are employees of U.S. air carriers, their contractors and subcontractors who report air carrier safety issues. Contractors are defined in AIR21 as a company that [performs safety-sensitive functions](#) by contract for an air carrier. This means that not all air-carrier contractor employees are covered by the protections of this law. Subcontractors are not defined in the law but it would seem to me that, logically, they would have to be performing some safety-sensitive function for their employees to be covered. But the law isn’t always logical and, of course, I’m not a lawyer.

AIR21 protects covered employees from retaliation, discharge, or otherwise being discriminated against for providing information relating to air safety violations to their employer or the federal government. Complaints regarding retaliation or discrimination are made to the U.S. Department of Labor’s Occupational Safety and Health Administration (OSHA). According to OSHA’s handy desk reference on AIR21, this includes “testifying or assisting in a proceeding against the employer relating to a violation or alleged violation of any order, regulation, or standards of the Federal Aviation Administration or any other Federal law relating to air carrier safety.”

Anyone considering filing a complaint under AIR21 should review OSHA's desk reference, as it provides information not readily apparent on either the FAA's or OSHA's website. For example, according to OSHA, an employee of an uncertificated air carrier would be covered by the protections of AIR21. Also, according to OSHA's interpretation, a contractor or a subcontractor could be a foreign corporation, as opposed to the requirement for the air carrier to be a U.S. citizen.

It's very important that an employee filing a claim with OSHA alleging discrimination or retaliation for reporting a safety issue [comply with the statutory time limits of 90 days](#) after the alleged adverse conduct occurred. Of course, any employee who believes he or she has been retaliated against would do well to consult an attorney familiar with whistleblower protection laws, both federal and state. Under AIR21, successful claimants can receive back pay, future pay, compensatory damages for emotional distress caused by the retaliatory conduct, and reasonable attorney fees.

While becoming a whistleblower is not something an employee should take lightly, it is imperative to the safety of the aviation system that employees report safety issues that they become aware of. Today, many aviation entities have [Aviation Safety Action Programs](#)—especially the major air carriers and large repair stations—that employees should take advantage of to report safety issues without fear of negative action by the FAA or their employer. [Not all reported events are covered by ASAP](#), so it's important to know what is and is not covered. For example, if a mechanic reported improperly filling out a maintenance record and the FAA and air carrier determined that it constituted falsification of a record, the mechanic's certificate could be revoked and his/her employment terminated.

Employees at aviation entities without an ASAP should consider using internal company or external government hotlines—even if done anonymously—to report safety issues.

If you do not fall within one of these employee categories, you can still report unsafe practices via the FAA's hotline or the OIG's, but you will not be entitled to the protections from discrimination or retaliation afforded by AIR21.

<https://osc.gov/News/Pages/19-18-FAA-Inspectors-Training.aspx>

<https://www.oig.dot.gov/investigations/dot-employee-whistleblower-protection>

<https://www.osha.gov/sites/default/files/AIR21DeskAid.pdf>

<https://hotline.faa.gov/>

<https://www.oig.dot.gov/hotline>

Pilots who fly your holiday packages want the same rest rules as the pilots who fly you to grandma's

- 1 Some House lawmakers are pushing to give cargo pilots rest periods that are more on par with passenger pilots.
- 2 Crews argue they shouldn't have different rest rules than passenger pilots.
- 3 Shippers say they have their own systems to manage rest and that on-again-off-again passenger airline schedules could pose safety risks for cargo pilots.



As the peak holiday season ramps up for online retailers and shipping companies, cargo pilots that fly packages for Amazon, UPS and FedEx are pushing to work under the [same rules as passenger pilots](#), a change that the industry says could pose safety hazards by abrupt schedule changes.

But some lawmakers think otherwise and are backing a single standard.

After lobbying from the package-delivery industry, cargo pilots were excluded from new rest requirements for pilots that took effect in 2014. Those rules required a minimum of [10 hours](#) of rest for passenger pilots in between flights. Rest requirements for cargo pilots remained at [eight hours](#).

Three House lawmakers — Reps. John Katko, R-N.Y., Salud Carbajal, D-Calif. and Matt Cartwright, D-Pa.— last week introduced the Safe Skies Act that would bring cargo pilots under the same rules as passenger pilots. A similar bill was reintroduced in the Senate earlier this year.

Several unions, including those representing pilots at UPS and FedEx, are urging lawmakers to make the change.

[Some say a change is overdue.](#)

“It’s ridiculous that we don’t [have the same rest rules for cargo pilots] and the only reason we don’t is for economic reasons,” said Chesley “Sully” Sullenberger, the former US Airways captain famed for his “Miracle on the Hudson” landing after a bird strike in January 2009. “Cargo pilots have the most demanding schedules. [They are the ones who need the most protections.](#)”

Robert Sumwalt, chairman of the National Transportation Safety Board, said the taxing job of flying long hours and crossing of multiple time zones pose concerns about [cargo-pilot fatigue](#).

“A lot of the cargo pilots are on the [back side of the clock](#), which introduces its own set of safety concerns with fatigue. That’s one major issue right there,” he said. “Cargo pilots are sharing the same airspace, flying into the same airports [as passenger pilots]. Why should there be a different level of safety?”

The stepped-up safety rules that were implemented in 2014 stemmed from NTSB recommendations after the February 2009 crash of a Colgan Air turboprop near Buffalo, N.Y. that killed all 49 on board and one person on the ground.

The agency's accident report [cited fatigue and a need for more training](#) — the last deadly U.S. passenger plane crash.

The Federal Aviation Administration said in a 2014 analysis that extending the same rest and duty rules to cargo-only airlines would provide a benefit of as much as \$10 million, but the costs would be around \$452 million and cargo pilots were subsequently left out of the new rules.

Pilots for Atlas Air Worldwide, one of the contractors Amazon uses for its package delivery services, have complained about fatigue and excessive overtime in recent months and are also pushing for the change.

The company said its pilots fly fewer segments than passenger pilots and that the current rules give its pilots better rest.

“Among all parties, there is a shared commitment to safety as the number one objective. Safety will never be compromised,” said Atlas spokeswoman Debbie Coffey.

Best use of rest

Industry members say their rest rules follow strict guidelines and that the nature of the job has different requirements and cargo pilots generally fly fewer, but longer trips, than passenger pilots.

Under the passenger rules, cargo pilots would have to work fewer days, which means more “first days” — think of it as a Monday after the long weekend — which could hurt performance since the [first day back at work is the most difficult](#), said Steve Alterman, president of the Cargo Airline Association.

Others say that the use of rest is what's important.

“It's the airlines' responsibility to ensure there is adequate time for pilots to rest, but [it is the pilots' responsibility to show up to work rested and ready to fly](#),” said Sharon Pinkerton, senior vice president for legislative and regulatory policy at Airlines for America, a trade group that represents most >

of the country's big passenger and cargo airlines, including FedEx and UPS.

Cargo pilot fatigue came into focus again after an August 2013 crash of a UPS plane on approach into Birmingham, Alabama. Both pilots were killed, and the NTSB cited [pilot fatigue as a contributing factor](#). It also said the first officer suffered acute sleep loss "[resulting from her ineffective off-duty time management and circadian factors](#)."

Several company and industry officials said the rules must also account for pilot commuting.

Atlas said it offers a program in which it pays for hotel rooms for pilots before their trips so they can rest before their shifts. "This allows for well-rested pilots who enjoy the option of being able to choose where they live," she said.

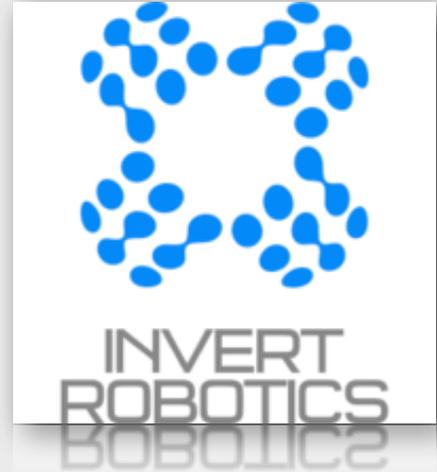
FedEx, which estimates about [70% of its pilots commute to their bases](#), says it takes a series of steps to mitigate risks from a lack of pilot rest, including sleep facilities at some airports and periodic reviews of routes whose schedules pilots find problematic. It also estimates that its layovers average 31 hours for international routes and that passenger flight layovers average 22.5 hours.

"In cooperation with our pilots, FedEx has developed the best, most scientifically [advanced fatigue mitigation program](#) in the airline industry," the delivery giant said. "Cargo and passenger pilots have very different schedules, and forcing cargo pilots to fly according to a set of rules developed for distinct conditions in a different industry will make them less safe. One size does not fit all when it comes to air travel safety."

Invert Robotics partners NDT to progress in aviation

New Zealand robotics company Invert Robotics has partnered with US aerospace non-destructive testing group NDT Solutions (NDTS) in a deal that will see its innovative robotic solution developed for aerospace applications.

Invert's remotely controlled robot features a patented suction mechanism that is capable of adhering to and traversing various aircraft surfaces, such as aluminum, carbon, or glass-fibre-reinforced plastic, says the company, which started life as a spin-off from New Zealand's University of Canterbury School of Engineering. The unique suction capability [allows technicians to scan the upper and lower fuselage or wing surfaces from a remote location in both wet and dry environments.](#)



“The unique suction technology of the Invert Robotics robot is a key differentiator, highly relevant to aircraft due to its ability to operate on [non-magnetic surfaces](#), whether aluminum or composite,” says John Blair, executive director aviation at Invert Robotics.

“This eliminates the many disadvantages of other robotic applications which have historically been bulky and enormously expensive,” he adds. Invert's robot and associated equipment weigh just 23kg and are easily transportable, enabling deployment [outside at airports](#), even aircraft at the gate as well as in adverse weather conditions.

The robot is equipped with a high-resolution camera to visualize and document surface conditions by transmitting video images to a ground-based screen for analysis by the technician.

Under the partnership with NDTs, the US group will further extend the capabilities of the robot [by adding functionality such as](#) ultrasound, eddy current, thermography and other inspection modalities, all of which will reduce the labour required, improve safety and minimize tedious inspection processes, allowing technicians to focus on more complex tasks, says Invert.

Invert, which started in the dairy industry conducting checks of dairy plants and later moving into the petroleum and energy industries, has been talking to airlines and maintenance, repair and overhaul companies worldwide to identify and develop specific capabilities of the robot to enhance its utility in aviation, says Blair.

“Some of these make the robot more user-friendly, reducing training needs and others expand the scope of inspection and tasks the robot can support, particularly applying [non-destructive testing (NDT)] technologies,” he adds.

The company is already working with [Air France Industries KLM Engineering and Maintenance](#) on a trial program in using the robot to reach areas of the fuselage [that are difficult for technicians, or for use in complex or repetitive tasks](#).

Invert expects the partnership with NDTs to allow it to make further progress in the aerospace industry.

“The partnership with NDTs provides for coordinated marketing of both the robot and the NDT tools in which NDTs has an established expertise and aviation market presence. The robot and each NDT technology are highly complementary and a combined package is already attracting strong interest,” says Blair.

Much of the focus on new inspection technology to date in aerospace has been on drones, notes Blair, [but these have restrictions](#), relating to safety regulations, weather conditions and their inability to have physical contact.

In addition to listing go and no-go medications, the FAA list—What Over-the-Counter (OTC) medications can I take and still be safe to fly?—provides a checklist for pilots to determine whether **they are fit for flight**. Pilots are advised to wait five times the dosing interval of a “no-go” medication before flying. In other words, if the medicine has a recommended four-hour interval between doses, pilots should wait 20 hours from the last dosage before flying.

https://www.faa.gov/news/safety_briefing/2018/media/SE_Topic_18-10.pdf

https://www.faa.gov/news/safety_briefing/2018/media/SE_Topic_18-10.pdf

https://www.faa.gov/licenses_certificates/medical_certification/media/OTCMedicationsforPilots.pdf

https://www.faa.gov/licenses_certificates/medical_certification/media/OTCMedicationsforPilots.pdf

Why Workplace Stress Creates Major Health Issues

Work-related stress affects 83 percent of employees, yet many companies are not treating this as a health issue.

Work-related stress affects 83 percent of employees, yet many companies **are not treating this as a health issue**.

Considering the well documented physical and mental effects on a worker, more needs to be done as soon as possible to deal with the problem of stress. First, it is important to understand its causes and effects on workers, then companies can start to find and implement better solutions.



This is a [national health crisis](#) that must be tackled for the wellbeing of employees, but it is also a way of increasing productivity and profit margins, so dealing with stress is a win for everyone. Despite this, only five percent of organizations are doing anything at all to combat employee stress.

Greatest Causes of Stress

Seventy-two percent of workers are stressed [by their financial situation](#), which means this should be a priority for employers. Financial stressors can easily be rectified by offering a pay rise, extra bonuses, incentive, or increased paid leave. However, workers should also be educated in borrowing finances, such as where to find bad credit personal loans and how to pay off outstanding debts.

People also experience fatigue and headaches when they are overworked. This forces them to work harder to get the same amount of work completed and at the same standard, which causes yet more stress. Streamlining and outsourcing daily operations can ease this workload. Beyond this, stress is mostly caused by personal relationships and parenting. Employers shouldn't be scared to offer support in these areas as well. Merely asking the right questions and allowing staff to talk about their personal issues in a comfortable setting can make the world of a difference, in terms of how they view their workplace and feel supported.

Physical Effects of Stress

[Too much stress can be deeply damaging to a person's health.](#) Energy levels will decrease, sleep becomes more difficult, eating habits worsen, the heart beats more rapidly, and illness becomes more frequent. From the perspective of both the employee and their boss, none of these symptoms are good news. As a result of these physical symptoms, a highly stressed individual is likely to be more easily agitated, have a decreased sex drive, avoid others, and experience a decline in perceived self-worth. These will all impact on that person's relationships. Maintaining happy connections to other humans is so essential to wellbeing and stress, therefore, needs to be dealt with.

Effective Remedies

Dealing with stress should be a part of every person's daily routine. One of the most effective cures is [exercise](#), which releases endorphins and lowers tension in the muscles. For many, half an hour a day is enough to cope with an overload of stress. [Regular breaks](#) can also help someone to manage a heavy workload. This time should be spent relaxing and not thinking about work. Whether meditating, playing video games, or spending time with the family, offering employees breaks to pursue their passions keeps stress at bay.

There are many health problems that can occur in the workplace, but [stress is perhaps the most widespread](#). Despite this, very few companies are putting any effort into fighting this epidemic. Given the very real and detrimental effects that stress can have on physical health and mental wellbeing, learning to deal with it is important to happiness. By creating happy workers who can deal more effectively with heavy workloads, this is also a guaranteed way to boost productivity.

<https://www.stress.org/42-worrying-workplace-stress-statistics>

<https://ohsonline.com/articles/2008/03/surveys-few-employers-addressing-workplace-stress.aspx?m=1>

<https://www.verywellmind.com/what-are-the-main-causes-of-stress-3145063>

<https://www.crediful.com/best-personal-loans-for-bad-credit/>

https://www.webmd.com/balance/stress-management/stress-symptoms-effects_of-stress-on-the-body#1

You Never Roam Alone

As a GA pilot, you have to gather information, analyze it, make decisions — and control the aircraft. That is no small challenge. But if you practice [the art of single pilot resource management \(SRM\)](#), you can enhance the safety of “crew of you” flights and land safely without bending metal or rules. Learn how to use the [5P approach](#) to manage your single-pilot resources in the article, “You Never Roam Alone! Putting Single Pilot Resource Management to Work” at <http://bit.ly/FAA-SRM>. For more resource management and error mitigation techniques, check out the Nov/Dec 2019 issue of *FAA Safety Briefing* magazine at www.faa.gov/news/safety_briefing.



<http://bit.ly/FAA-SRM>

http://www.faa.gov/news/safety_briefing

ASRS Pilot Reports Relay ADS-B Pros and Cons

With more aircraft equipped with ADS-B, [NASA's Aviation Safety Reporting System \(ASRS\)](#) is starting to receive more pilot comments on specific instances where ADS-B In played a role in collision avoidance.

For example, ADS-B provided [situational awareness](#) to a Cessna 172 pilot with respect to unannounced traffic at a non-towered airport.

The pilots estimated the other aircraft, which was not talking on frequency, passed nearly overhead and about 200 feet above them. “Had we not seen him [on ADS-B], I believe he would have hit us,” the pilot wrote in the ASRS report.

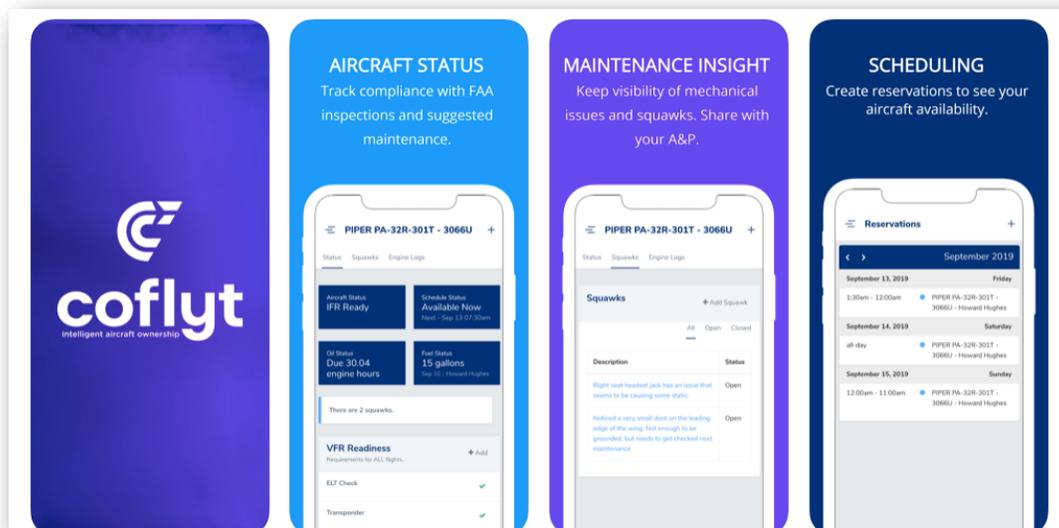
A Cessna 182 pilot in IMC observed a conflicting aircraft on the onboard traffic advisory and alert system. Although ATC said the threat aircraft (a Cessna CitationJet) was going to pass well clear, the pilot said the ADS-B display indicated “maneuvering was required.” Upon landing, downloaded ADS-B data from both aircraft showed that although the Citation began a descent, it “briefly leveled off at 10,000 feet (our altitude). This happened just as they were passing our location.”

However, many ADS-B targets were displayed while one pilot transitioned Class C airspace in VMC, making it harder to discern threats. The absence of any traffic advisory resulted in a false sense of security “when an aircraft came directly head-on and passed underneath me probably 100 to 200 feet...ADS-B wasn’t too helpful there, because I was right over the airport and there were a lot of targets on the ground and in the air, so it was hard to make any sense of the traffic scope with the targets overlapping.”



http://asrs.arc.nasa.gov/publications/callback/cb_478.html

Introducing Coflyt: An App for All of Your Aviation Needs



The Coflyt team is incredibly excited to launch their new app on the Apple and Google Play stores. Coflyt is intelligent aircraft software that will **provide pilots peace of mind by combining required** inspections, maintenance tracking, scheduling, and billing into a simple app to provide convenience to aircraft owners and pilots.

With the launch of Coflyt, pilots will be able to **fully automate their aircraft management** for better communication across their ownership team, which can include partners, A&P's, insurance brokers, or their flying club.

Coflyt offers:

- Maintenance insights to keep the aircraft ownership team informed about maintenance items or squawks
- Aircraft status to view required VFR/IFR inspection statuses

- Shared aircraft management to log flights by multiple pilots and analyze usage
- The ability to share aircraft information with a pilot's A&P or others involved in the aircraft's management.

"We were aware that the majority of aircraft owners were still keeping their aircraft information and records in [an inefficient manner](#) by using paper documents, excel spreadsheets, or other disconnected tools with little to no communication between the involved parties. There were often maintenance issues that were missed and flight logs that were not recorded, so we formed the Coflyt team to provide improved tools for the aviation community. We worked to create an in-depth app that helps [owners, pilots, and mechanics](#) care for their aircraft intelligently, with an even greater value for those who are sharing ownership responsibility."

-Tal Clark, Coflyt Founder

Coflyt is helpful to any pilot, flight school, flight club, or mechanic that is involved with the ownership and care of general aviation aircraft. Those using the aircraft are able to utilize the app to create an accurate log of all flights, pilots, distances travelled, and more.

With this information, [A&P's or aircraft owners can manage maintenance and schedule upcoming care](#). The full aircraft ownership team is able to use Coflyt to ensure they are consistently meeting all inspection requirements and that the aircraft is ready for flight, without having to pull out log books or worry about contacting others who may have used the aircraft.

Coflyt is able to:

- Track FAA compliance with inspections and suggested maintenance
- Record squawks and provide visibility to others
- Log aircraft flight times and provide reports on usage
- Create reservations and view aircraft availability
- Share information with all aircraft users

- Provide financial tools for partners within the app
- And more

To view full testimonials from pilots and airline mechanics about how this app is changing the way they operate, [watch this video from the Coflyt team](#).

About Coflyt

Coflyt was founded by Tal Clark and Eric Hill, who are both pilots with a wide range of aviation experience. They recognized the lack of tools and technology available for aircraft owners to manage their aircraft, so Coflyt was created to provide the latest in technology to general aviation to improve the ownership and flying experience.

During the development and "soft launch," the Coflyt team analyzed all of their needs and sought the input of others in the aviation community. They took suggestions from sources including A&P's, flight schools, and flight clubs to ensure that Coflyt met the needs of the broader aviation community. As more and more people use the app, the Coflyt team looks forward to continued feedback, and will continue to provide the most innovative experience possible in the general aviation space for managing and owning an aircraft.

https://c212.net/c/link/?t=0&l=en&o=2651967-1&h=1247003128&u=https%3A%2F%2Fvimeo.com%2F359431181%3Ffbclid%3DIwAR3NvK_CFZ2zv2Hktu-xXtpckZ1YOBSwdk8dTd4l03ttDS_OET8OfTUu7o&a=watch+this+video+from+the+Coflyt+team

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[Download Coflyt on Google Play](#)

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Sleep Deprivation Triples Number of Lapses in Attention

Published in the *Journal of Experimental Psychology: General*, research from Michigan State University's (MSU) Sleep and Learning Lab assesses [how sleep deprivation impacts placekeeping](#); that is, the ability to complete a series of steps without losing one's place, despite potential interruptions. This study builds on prior research from MSU's sleep scientists to quantify the effect lack of sleep has on a person's ability to follow a procedure and maintain attention.



“Our research showed that sleep deprivation [doubles the odds of making placekeeping errors and triples the number of lapses in attention](#), which is startling,” says Kimberly Fenn, PhD, in a release. “Sleep-deprived individuals need [to exercise caution in absolutely everything that they do](#), and simply can't trust that they won't make costly errors. Oftentimes—like when behind the wheel of a car—these errors can have tragic consequences.”

By sharing their findings on the separate effects sleep deprivation has on cognitive function, Fenn—and co-authors Michelle Stepan, MSU doctoral candidate, and Erik Altmann, PhD, professor of psychology—hope that people will acknowledge [how significantly their abilities are hindered](#) because of a lack of sleep.

“Our findings debunk a common theory that suggests that [attention](#) is the only cognitive function affected by sleep deprivation,” Stepan says.

“Some sleep-deprived people might be able to hold it together under routine tasks, like a doctor taking a patient’s vitals. But our results suggest that completing an activity that requires following **multiple steps**, such as a doctor completing a medical procedure, is much riskier under conditions of sleep deprivation.”

The researchers recruited 138 people to participate in the overnight sleep assessment; 77 stayed awake all night and 61 went home to sleep. All participants took two separate cognitive tasks in the evening: one that measured reaction time to a stimulus; the other measured a participant’s ability to maintain their place in a series of steps without omitting or repeating a step—even after sporadic interruptions. The participants then repeated both tasks in the morning to see how sleep-deprivation affected their performance.

“After being interrupted there was a 15% error rate in the evening and we saw that the error rate spiked to about **30% for the sleep-deprived group** the following morning,” Stepan says. “The rested participants’ morning scores were similar to the night before.

“There are some tasks people can do on **auto-pilot** that may not be affected by a lack of sleep,” Fenn says. “However, sleep deprivation causes widespread deficits across all facets of life.”

<https://www.ncbi.nlm.nih.gov/pubmed/31750712>