

Aviation Human Factors Industry News

Volume XI. Issue 01, January 11, 2015



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

Hello all,

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

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FAA's Aviation MX Human Factors Newsletter



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http://www.faa.gov/about/initiatives/maintenance_hf/fatigue/publications/



Jan. 1 Issue of Vectors for Safety Now Available

The latest issue of Vectors for Safety is now available.
Click [here](#) to go to the newsletter.

What's New?

Check out the "What's New?" section for some really big news about my safety initiative!

The "What's New?" section also addresses a change in the NTSB website and how to locate the accidents I have discussed in previous issues.

Operational Tip

The Ops Tip this month discusses the need to look beyond the NTSB probable cause findings in accidents to find the underlying factors involved.

Two accidents are discussed and we take a a more in-depth look into what might have really happened.

Quick Turns

Many pilots who use their aircraft in their business, even if infrequently, are actually business aviation pilots. That's great until we realize that the highest accident rate in general aviation is attributed to the owner-flown business airplane. Some ideas on how to be safer in those operations are provided.

And we take a look at what I think is a great idea from Sporty's. They are refurbishing a Cessna 172 and making it a bare-bones primary trainer. It isn't right for everybody, but it can be great in many cases.

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Click [here](#) to go to the newsletter.

Please visit my website, genebenson.com for more safety information including free online courses, many are valid for FAA Wings credit.

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"Vectors for Safety" is published approximately once per month courtesy of Bright Spot, Inc.

If you find this publication useful, please forward it to other pilots.

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FAA ready for 2015

The Federal Aviation Administration's enduring mission is to ensure that the United States has the safest, most efficient aerospace system in the world. In 2014, the FAA has taken many steps to accomplish this result. Here are highlighted three particular efforts.



First, the FAA issued a rule that requires **helicopter operators**, including air ambulances, to have stricter flight rules and procedures, improved communications, training, and additional on-board safety equipment. This rule will help reduce safety risk involved in helicopter operations and help pilots make good safety decisions through the use of better training, procedures, and equipment. The rule represents the most significant improvements to helicopter safety in decades and responds to government and industry concerns over continued risk in helicopter operations. **Second**, the FAA continues to modernize the airspace system by **implementing NextGen** – our major initiative to make flying more efficient and greener, while ensuring that all safety needs are met. NextGen includes our Metroplex initiative, an effort to reduce air traffic congestion in the nation's busiest metropolitan areas. As part of our Metroplex initiative, we implemented scores of new satellite-based air traffic procedures in several major cities, including Houston, North Texas and Washington D.C. These procedures are helping to increase on-time arrival, and reduce fuel consumption and emissions, results that are benefiting the airlines, the passenger, and the environment. For instance, in the North Texas area, we implemented 80 new satellite-based air traffic procedures. We project that airspace users will save 4.1 million gallons of fuel each year, resulting in a savings of 41,000 metric tons of carbon dioxide emissions and \$10.3 million dollars.

Third, the FAA continues to make strides toward safely integrating unmanned aircraft into the nation's airspace system. **Unmanned aircraft** are a burgeoning technology, and the application of the technology is limited only by our imagination. The FAA has chosen six unmanned aircraft test sites that are now operational. The research conducted at these sites will help inform the FAA as we move forward with integration. In addition, the FAA has begun a process for approving commercial unmanned aircraft operations in low-risk situations such as moviemaking, agricultural research and utility surveying.

Unmanned aircraft often provides a safer alternative to work that can be very high risk in manned aircraft. The agency hopes to issue a rule for public comment very soon on small unmanned aircraft.

These three accomplishments are just a few of the many projects we've been focused on in 2014. In the coming year, we look forward to continuing these efforts to ensure the safety and efficiency of aviation for our nation.

http://www.faa.gov/news/press_releases/news_story.cfm?newsId=15795

<http://www.faa.gov/nextgen>

http://www.faa.gov/news/press_releases/news_story.cfm?newsId=16875

FAA Issues Safety Management System Rule

The FAA will announce a final rule on Jan. 7, 2015 to require all Part 121 airlines to have safety management systems. A safety management system is defined by the FAA as "the formal, top-down, organization-wide approach to managing safety risk and assuring the effectiveness of safety risk controls." Most major carriers already have their own ways of achieving the same goals but the FAA rule will create standards for SMS systems. Many other countries have already implemented similar regulations and the SMS rule will make the U.S. comply with membership requirements for the International Civil Aviation Organization (ICAO). The Notice of Proposed Rulemaking for the initiative was issued in November of 2010. A parallel NPRM covering certificated airports was also issued then. The new rule will be announced at a media event in Washington. It will be attended by Transportation Secretary Anthony Foxx, FAA Administrator Michael Huerta and Nicholas Calio, CEO of Airlines for America, the industry trade group that represents the major airlines.



http://rgl.faa.gov/Regulatory_and_Guidance_Library/rgNPRM.nsf/0/42E89B67305F32E2862577D20067C0E6?OpenDocument&Highlight=safety%20management%20system

Researchers Find Expert Pilots See Differently

An experienced pilot will make a better decision about whether to attempt a marginal landing while showing **only about half as much brain activity** as less experienced pilots, according to a recent study completed by scientists at Stanford University. The research used a flight simulator set up like the cockpit of a single-engine airplane. Eight experienced pilots and 12 less experienced pilots were tested as they attempted to land, while their brain activity was scanned. As they approached 200 feet, the program would display the runway with varying degrees of clarity or fog, and the pilots would have to decide whether or not to land. The reduced neural activity in expert pilots suggests that they are able to complete the task at hand **with fewer brain resources**. "The data show that the expert pilot seems **to just know what to look for, where to look and when to look**," said Maheen Adamson, lead author of the study. Researchers hope they can use the data to help **design interactive lessons** that guide less-expert pilots into **behaviors** that mimic the more efficient brain activity of more-expert pilots. "In the future, we could put a trainee in a scanner and see what mechanism in their brain they're using to get better at the task, and train them to reallocate resources in the brain more efficiently," Adamson said. "If we are able to train pilots to process instruments and other visual cues more efficiently, you could reduce the likelihood of accidents during landing."



Qantas Named World's Safest Airline For 2015

AirlineRatings.com the world's only safety and product rating website has announced its top ten safest airlines and top ten safest low cost airlines for 2015 from the 449 it monitors.

Top of the list again is Qantas which has a [fatality free record in the jet era](#). Making up the remainder of the top ten in alphabetical order are: Air New Zealand, Cathay Pacific Airways, British Airways, Emirates, Etihad Airways, EVA Air, Finnair, Lufthansa and Singapore Airlines.

AirlineRatings.com's rating system takes into account a variety of factors related to audits from aviation's governing bodies and lead associations as well as government audits and the airlines' fatality records.

AirlineRating.com's editorial team, one of the world's most awarded and experienced, also examined airlines' operational histories, incident records and operational excellence to arrive at its top ten safest airlines.

According to AirlineRatings.com editor, Geoffrey Thomas, "our top ten safest airlines are [always at the forefront of safety innovation and launching new planes](#)." "These airlines are a byword for excellence," he added. "There is no doubt that Qantas is a standout in safety enhancements and an industry benchmark for best practice," said Mr Thomas.

Over its 94-year history Qantas has amassed an extraordinary record of firsts in safety and operations and is now accepted as the world's most experienced airline. "Qantas has been the lead airline in virtually every major advancement in airline safety [over the past 60 years](#)," said Mr Thomas.

Responding to public interest, the AirlineRatings.com editors also identified their top ten safest low cost airlines.

These are in alphabetical order: Aer Lingus, Alaska Airlines, Icelandair, Jetstar, Jetblue, Kulula.com, Monarch Airlines, Thomas Cook, TUI Fly and Westjet.

"Unlike a number of low cost carriers these airlines have all passed the stringent International Air Transport Association Operational Safety Audit (IOSA) audit and have excellent safety records," said Mr Thomas. "[Low cost does not mean low safety](#)."

Of the 449 airlines surveyed 149 have the top seven-star safety ranking, but almost 50 have just three stars or less.

Five airlines only achieved one star for safety from AirlineRatings.com. These are: Agni Air, Kam Air, Nepal Airlines, Scat and Tara Air.



<http://www.airlineratings.com/news.php?s&id=425>

http://www.airlineratings.com/safety_rating_criteria.php

Aviation Safety Network: 2014 Was Safest Year for Airliner Accidents

In 2014, airliner accident statistics from the Aviation Safety Network (ASN) showed a record low total of 21 fatal airliner accidents, resulting in 990 fatalities. ASN is a service offered by the Flight Safety Foundation, whose purpose is to [provide impartial, independent, expert safety guidance and resources](#) for the aviation and aerospace industries.



The numbers posted in 2014 make it the safest year ever by number of fatal accidents and the [24th safest year](#) ever in terms of fatalities. Most accidents involved cargo flights (10) and passenger flights (eight). The worst accident last year happened on July 17 when a Malaysia Airlines Boeing 777 (flight MH17) crashed in Ukraine, killing 298. The low number of accidents comes as no surprise, according to ASN President Harro Ranter: “Since 1997 the average number of airliner accidents has shown a steady and persistent decline, for a great deal thanks to the [continuing safety-driven efforts by international aviation organizations such as ICAO, IATA, Flight Safety Foundation and the aviation industry,](#)” he said in a press release.

ASN found that Africa still is the least safe continent, accounting for 43 percent of all fatal airliner accidents. This despite the continent only having approximately three percent of all world air traffic. Statistics for 2014 are based on a selection of worldwide fatal accidents involving civil aircraft with a minimum capacity of 14 passengers.

FAA Proposes \$317,500 Civil Penalty Against United Airlines

Allegedly Operated An Aircraft That Was Not Properly Maintained

The FAA is proposing a \$317,500 civil penalty against United Airlines, Inc. of Chicago, IL for allegedly operating an aircraft that was not in compliance with Federal Aviation Regulations. The FAA alleges that on January 19, 2013, United mechanics removed and replaced a nose landing gear wheel and tire on a Boeing 767 [without installing a required axle washer](#). The Boeing and United maintenance manuals warn that the wheel bearing can fail if the washer is not installed. An FAA inspector discovered the missing washer [during a routine inspection](#).



United allegedly operated the aircraft on 35 passenger flights when the washer was missing. The aircraft was not in an airworthy condition during those flights, the FAA alleges.

United has requested to meet with the FAA to discuss the case.

FAA Internal Report Finds Pilots in Philly US Airways Crash Didn't Properly Set Flight Computer

A report published by the FAA says that a crash at Philadelphia International Airport was caused by the pilot [having drugs in his system](#). (Published Wednesday, Dec 31, 2014)

The pilots behind the controls of a US Airways flight that crashed at Philadelphia International Airport in March failed to properly prepare the aircraft for takeoff, a Federal Aviation Administration report obtained by NBC10 concluded. Officials also found the plane's captain [had prescription drugs in his system that should have disqualified him from flying](#).

Initial findings by the National Transportation Safety Board (NTSB) blamed the crash on wind sheer, but the internal FAA report [points to pilot error](#).

The incident report, provided to NBC10 Investigative Reporter Harry Hairston through a Freedom of Information request, states the flight crew of US Airways flight 1702 [did not enter](#) velocity speeds needed for departure into the Airbus A320's flight computer.

Once the pilot throttled up for takeoff along Runway 27 Left on March 13, an [alarm sounded warning that cockpit](#) levers were not set, the report said. The co-pilot relayed part of a written message prompting the pilot to move the levers to the "Take Off Go Around" position, according to the report.

However, the pilot only put the throttle in the Flexible Take-Off position and once the jet reached a speed of 92 mph, another alarm sounded warning the crew to move the engines into an Idle position, the report said. This is used during landing.

According to the report, the captain asked his co-pilot whether she had ever heard such an alarm on takeoff before. She answered "No." Despite the alarms, the crew continued with takeoff.

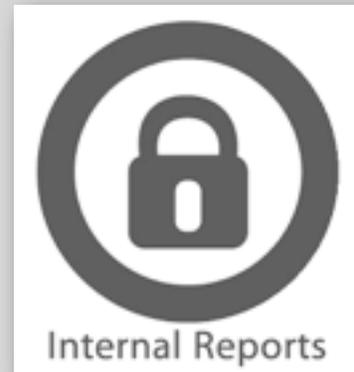
"We'll get that straight when we get airborne," officials quoted the pilot as saying.

These audio recordings obtained by NBC10.com through a Freedom of Information request via the FAA details the moments during and after the March 13 crash at Philadelphia International.

The Fort Lauderdale, Florida-bound airliner, carrying 149 passengers and five crew, reached a speed of about 183 mph and 70 feet off the ground when the pilot felt "the aircraft was unsafe to fly," the report stated.

He moved the throttle into the Idle position and the plane's tail smashed into the runway, followed by the middle landing gear, the report said. The hard landing forced the plane's nose into the ground, causing the landing gear to collapse and sent the jet skidding 2,000 feet across a grass field.

As it was sliding, the plane's left engine sucked up runway lights and dirt causing it to smoke as passengers ran away to safety. Two passengers suffered minor injuries and had to be taken to the hospital.



"They should have never commenced to take off," aviation expert Arthur Wolk said after reviewing the report with the NBC10 Investigators. "When they applied takeoff power, they got warnings the system was not properly set and the information they needed was not there."

"That could have been a horribly fatal accident," he added. The report also says that the plane's captain should not have even walked into the cockpit. He underwent a stress test two days before the crash and [was given two drugs](#) - the sedative Midazolam and narcotic Fentanyl, the report said.

Based on how the body processes these drugs, the pilot would not be fit to fly until 60 hours after taking them. He returned 45 hours later and [did not inform](#) US Airways about his condition, officials said.

"These drugs have the ability impair one's attention and now we have an incident that relates to one's failure to attend to the business at hand which was to make sure the airplane was properly configure for taken off," Wolk said.

A US Airways spokesperson declined to comment until the NTSB finishes its investigation.

The internal FAA report will be provided to the NTSB and a final report is expected to be released in Spring 2015.

FAA Mistakenly Released Draft Internal Report During NTSB Investigation

Reminds Parties To Investigations That Information Release Must Be Coordinated With The Board

The NTSB has found that the Federal Aviation Administration [mistakenly released investigative information, an error](#) that violated NTSB regulations and party process in our investigation of a March 13, 2014, airplane accident in Philadelphia.

The accident, involving a US Airways passenger jet, is currently under investigation by the NTSB. Recently, the FAA, which is a party to the investigation, [mistakenly released preliminary information](#) about the accident under the Freedom of Information Act. The NTSB depends upon full participation and technical assistance by the parties in our accident investigations – in this case, the FAA, the airline, and the pilots’ association -- in order to ensure that our investigations are objective, rigorous, and complete. Allowing any party to release investigative information without approval [may enable that party to influence the public perception](#) of the investigation, and undercut the fairness of the process.



Accordingly, the NTSB reminds all parties involved in an investigation that it requires that any release of information related to an ongoing accident investigation be coordinated and approved by the NTSB prior to its release. When the investigation is complete, [these restrictions no longer apply](#). Because this investigation is not yet complete, the FAA was required, but failed, to notify and seek the necessary approval from the NTSB prior to releasing their draft report.

The NTSB has shared its strong concern about this matter with the FAA. As a result, the FAA is reviewing this case to see how the disclosure of information occurred and will review its policies and procedures to ensure that information from accident investigations is properly protected.

[runwaySimulator Airport Capacity Model](#)

For several years, the FAA has used the results of an airport capacity tool called the runwaySimulator model, developed by MITRE. The FAA and MITRE are now making the tool [publicly available for aviation applications](#), including airport planning. The tool is designed to assess an airport's existing capacity, as well as capacity improvements such as new infrastructure or flight procedures.



The tool replaces the FAA's Airfield Capacity Model (ACM), which is now dated.

Request Access to runwaySimulator

You can request access to the tool and related training.

- [Request access to the runwaySimulator tool, license, and training](#)
- [Submit a software bug report](#)

A Death in the Workplace: What's Killing Workers?

Do you know what the leading causes of death are in American workplaces? Each year, the Bureau of Labor Statistics (BLS) tallies the statistics, releasing data from 1 to 2 years in arrears. Despite the delay in reporting, there is a certain consistency from one year to the next: Many of the same hazards remain a threat to workers. [Do you know what they are?](#)

The Top Three Killers

The top three killers in 2013 were:

Transportation incidents. This category includes injuries that occur on roadways, like car crashes; incidents that occur off-road, like tractor overturns; and incidents that result from travel by airplane and train. Transportation incidents accounted for about 40% of all work-related fatalities in 2013. Sixty percent of these deaths (991 fatalities) were roadway incidents—car and truck crashes involving workers who are “on the clock.” Sixteen percent (284 fatalities) involved pedestrians struck by vehicles; 48 of those deaths occurred in highway work zones. Another 13% were off-road transportation incidents.



The takeaway for employers: If you have any kind of fleet vehicles, or workers who are on the road and on the clock, you need a thorough and effective fleet safety program. Workers in highway work zones and off-road transportation situations represent a special case, with issues all their own; for them, also, you will need a specific program to ensure workplace safety.

Violence. This category includes not only homicides but also suicides (yes, there is such a thing as on-the-job suicide) and deadly assaults by animals. All told, 753 workers died of violence in 2013; more than half (397) were homicide victims. Fully 35% (270 deaths) were suicides. Homicide also disproportionately affects women in the workplace—it is the second-leading killer of women at work. Of the 302 women who died at work in 2013, 22% were homicide victims; only 8% of male fatalities were homicides.

The takeaway for employers: Most employers are aware of their risk of homicidal violence; however, fewer are aware of the annual toll that suicide takes. How is your employee assistance program? Is it up to the challenge of preventing worker suicides?

To protect women in the workplace, you may need a program to address domestic violence as well as other homicide risk factors (like handling money or prescription drugs).

Falls. There are two main categories of fatal falls: falls on the same level and falls to a lower level. Falls on the same level account for far more injuries, but fewer fatalities—only 18% of fatal falls were falls on the same level. Of fatal falls to a lower level, 25% were falls of 10 feet (ft) or less; about 20% were falls of greater than 30 ft, and the remainder were falls from 10 to 30 ft.

The takeaway for employers: Anytime you have workers who are exposed to a fall greater than 10 ft, you are probably aware of it and taking appropriate precautions—but don't overlook falls on the same level, or "small" falls of less than 10 ft—falls of these types accounted for a substantial minority of fatal falls in 2013.

Rounding out the top five categories of fatal hazards were "**contact with objects and equipment**"—a broad category that includes struck-by hazards, falling object hazards, and caught-in hazards—and fires and explosions, a category that was deadlier than usual in 2013 because of some multi fatality incidents, including the Yarnell Hill wildfires in Arizona that killed 19 firefighters.

Top Anti-Nausea Foods

Feeling a little queasy? Here's what to eat to find relief

When you're feeling nauseated, the last thing you want to do is chow down on a hamburger and fries. And you certainly shouldn't. However, believe it or not, eating the right kinds of food can help alleviate queasiness and help your stomach find relief. In addition, it's important to replenish nutrients and liquids if you're vomiting. Running on an empty stomach may actually cause more nausea.



You may not have much of an appetite, but when your stomach is feeling unsettled, try reaching for these calming foods.

Crackers - Dry, starchy snacks such as pretzels or animal crackers, can help absorb nausea-inducing stomach acid. Plus, they're bland, so they will go down more easily than strongly-flavored foods or ones that give off a strong smell.

Ginger - This root has been shown to reduce some types of nausea, whether eating pickled ginger, a piece of ginger candy or sipping on a glass of ginger ale.

"White" foods - "White" foods with no pigment, such as white rice, oatmeal, toast, boiled potatoes and plain yogurt, have little flavor and odor, making them more soothing on the stomach than others. These foods are also easy to digest.

Apples - The fiber in this juicy fruit may help reduce nausea-related elements in your system. If you're not up for the whole fruit, go for the soft stuff like applesauce or apple juice. Or, if you're not a fan of apples in general, pears or pear juice may help soothe your belly in the same way.

Bananas - This potassium and magnesium-loaded fruit can work to stimulate the production of mucus from the stomach lining, which may block what's causing your nausea. However, bananas can fill you up quickly, so cut one into pieces or just eat half to avoid getting too full too quickly.

Simple beverages - Drinks such as water, electrolyte-induced sports drinks like Gatorade, tea or coconut water qualify as nausea-stopping sips.

And as a bonus, liquid will help you prevent dehydration if you're throwing up. One thing to keep in mind: "Drink between, rather than during, meals—ingesting fluids on top of food may fill you up faster and cause nausea," advises Michael Stafford, RD, CSO, LD, oncology dietitian at the Medical University of South Carolina's Hollings Cancer Center.

Popsicles - Too queasy to drink a whole glass of water? Sucking on a popsicle may help alleviate queasiness. You could also try sucking or chewing on an ice cube, which can not only help nix nausea, but help you take the focus off the uncomfortable feeling.

Just like some foods will keep nausea at bay, others may do just the opposite. If your stomach is acting up, **avoid foods that are overly** spicy, sweet, greasy or fried. Also, skip foods with a strong odor, which may trigger nausea. Keep these tips in mind (and food on hand), and you'll feel better in no time.

For Night Shift Workers, Sleep Inertia Adds Risk to Naps

Sleeping on the job is a necessary reality for many night shift workers, but a new study suggests that instead of providing an energy boost, a night-time nap **might put workers at risk.**

Research on sleep inertia—the state you are in when you first wake up—by the University of South Australia's Centre for Sleep Research PhD candidate Cassie Hilditch has particular relevance for **night shift workers in safety-critical industries** such as healthcare or transport, who have to return from breaks and operate at full capacity. "Sleep inertia is the groggy feeling most people experience when waking up, and is characterized by slow reaction times, poor decision-making, and reduced information processing," Hilditch says. "This doesn't matter for people getting dressed in the morning, but for workers in industries such as **aviation**, petrochemicals, transport, and health, **post-nap alertness is critical for workplace safety.**"



Hilditch's study found a 30-minute nap during a night shift produced long-lasting sleep inertia, with recovery times of up to 45 minutes.

A 10-minute nap during a night shift, however, helped stabilize performance during the hour after waking, with little-to-no sleep inertia.

Hilditch says her research shows the importance of workers allowing time between a nap and the recommencement of work.

“Our research suggests that if you have a 30-minute break in a shift at night, it's better to take a 10-minute nap at the start of your break. Don't take a 30-minute nap if you need to return to work straight away,” Hilditch says. “Our participants were well-rested before the study, so these are likely to be best-case figures, as shift workers may already have cumulative fatigue, which could prolong recovery from sleep inertia. In the real world, people are carrying a lot of sleep debt.”

Cognitive tests also revealed participants tended to overestimate their abilities after a nap, with the gap between perception and reality producing further risk. “If sleep inertia persists beyond your break, and you think you're more alert than you actually are while, say, operating heavy machinery, then there is a clear safety risk,” Hilditch says. “One of the challenges is getting people to recognize their limitations. Shift workers might think that since they've been doing shift work for 6 years, they are fine, but they might not be—many studies support this.”

Hilditch's findings may also have an implication for desk-based jobs. “Lawyers or people in finance might work super-long hours, and their decision-making is just as impaired as the next person's; it's just that the risk is financial,” she says.

Prior to her PhD, Hilditch spent 5 years working for a research consultancy in London, undertaking fatigue-related research in safety-critical industries. In this role, she developed fatigue risk management systems in settings ranging from the Libyan desert to the Swiss Alps.

“Trying to give people advice on how to schedule shifts made me realize we don't know enough to provide all the details,” Hilditch says.

<http://www.unisa.edu.au/Research/Centre-for-Sleep-Research>

TED Talks - Ideas worth Spreading

Kelly McGonigal: How to make stress your friend

Stress. It makes your heart pound, your breathing quicken and your forehead sweat. But while stress has been made into a public health enemy, new research suggests that stress may only be bad for you **if you believe that to be the case**. Psychologist Kelly McGonigal urges us to see stress as a positive, and introduces us to an unsung mechanism for stress reduction: reaching out to others.



http://www.ted.com/talks/kelly_mcgonigal_how_to_make_stress_your_friend