Aviation Human Factors Industry News

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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:

European Plan for Aviation Safety 2020 – 2024

The EPAS, a key component of the European Aviation Safety Program, provides a coherent and transparent framework for safety management at regional and State level, supporting the goals and objectives of the ICAO Global Aviation Safety Plan (GASP).

The 2020-2024 edition includes 180 actions, among which the complete set of EASA rule-making tasks. A new structure for the list of actions is presented to better highlight key risk areas and improve the link with the domain risk portfolios presented in the EASA Annual Safety Review.

EPAS constitutes the regional aviation safety plan for EASA Member States, setting out the strategic priorities, strategic enablers and main risks affecting the European aviation system and the necessary actions to mitigate those risks and to further improve aviation safety. EPAS is a 5-year plan that is constantly being reviewed and improved and updated on a yearly basis. The plan is an integral part of EASA's work program and is developed by EASA in close consultation with the EASA Member States and industry.

The main objective of EPAS is to further improve aviation safety and environmental protection throughout Europe while ensuring a level playing field, as well as efficiency/proportionality in regulatory processes. EPAS' aspirational safety goal is to achieve constant safety improvement within a growing aviation industry.

This EPAS edition, being the 9th edition of the plan, brings about the following novelties:

- Strategic priorities are consolidated based on input from the EASA Advisory Bodies and to consider new technological developments and business models;
- Strategic enablers are updated to reflect recent developments;
- Safety information stemming from both the Standardization Annual Report and the Annual Safety Review is better articulated;
- Further alignment with the ATM Master Plan is achieved and the recommendations stemming from the Report of the Wise Persons Group on the Future of the Single European Sky and of the Airspace Architecture Study performed by SESAR JU considered;
- New developments in the area of Unmanned Aircraft Systems (UAS) and U-space are included;
- The recommendations from the C-UAS (Counter Drones) Task Force are highlighted;
- New or amended roadmaps are presented on rotorcraft safety, general aviation and artificial intelligence ;
- A new structure is provided for Volume II (containing all EPAS actions): EPAS actions are grouped per domain, thereby strengthening the link with the domain risk portfolios in the Annual Safety Review.

https://www.easa.europa.eu/sites/default/files/dfu/EPAS_2020-2024.pdf

https://www.easa.europa.eu/document-library/general-publications?publication_type%5B0%5D=144

Fly the Way You Train, Train the Way You Fly

Episode 15

They have dissected the more than 300 pages of the Indonesian National Transportation Safety Committee (NTSC) final report on Lion Air Flight 610 and John and Greg reach a very different conclusion. The Maneuvering Characteristics Augmentation System (MCAS) was not the root cause, flight crew deficiencies are more likely the root cause.
Once again, John and Greg stick to the facts presented in the report. They find that those facts are twisted in the report analysis as well as media coverage. This leads to misplaced blame on the MCAS system and, worse, missed opportunities to improve aviation safety.

Calling the conclusion that MCAS was the cause a “leap of logic,” John and Greg instead look at documented issues with crew training and the direct parallels those issues have to what happened in the cockpit that fateful day.

https://www.flightsafetydetectives.com/e/fly-the-way-you-train-train-the-way-you-fly/

FAAST Blast

Peak Performance

Accident investigations have discovered causal factors resulting from unreasonable expectations of aircraft performance — especially when operating at the edges of the aircraft weight and balance envelope. That’s why the General Aviation Joint Steering Committee’s Loss >

of Control Work Group suggests improvement in pilots' understanding and calculation of aircraft performance. Check out #FlySafe fact sheet on Aircraft Performance and Calculations at http://bit.ly/VxVy. To see the most current versions of all our #FlySafe fact sheets, arranged by topic, go to http://bit.ly/GAFactSheets.

http://bit.ly/VxVy

http://bit.ly/GAFactSheets

No Surprises

Today's aircraft avionics offer GA pilots an unprecedented level of situational awareness. However, these complex systems can quickly transform a Pilot in Command to a Pilot in Confusion. In her article, "No Surprises" in the Jan/Feb 2020 issue of *FAA Safety Briefing*, editor Susan K. Parson explores how to exercise good risk management skills that will help you keep control of avionics and automation in your aircraft.

To read the article, go to: https://adobe.ly/2QuvEqS. Check out the entire Jan/Feb 2020 issue at www.faa.gov/news/safety_briefing.

Safety Differently, by Learning from the Good

For decades, aviation safety practitioners have poured resources into investigating incidents and accidents looking for what went wrong. From that work, lessons are learned with the hopes that those mistakes won't be repeated, preventing a future tragedy.

Now there is a move afoot to do safety differently. Researchers have flipped the script and are looking at routine flights to learn what pilots are doing right. Early results show promise—apparently, there is a lot to learn from studying success.

Research suggests there are many opportunities to learn from the behavior of those pilots that excel in very complex and dynamic operating environments. One powerful analogy by Leiden University's Marit de Vos describes our current system as "it's like we've been trying to learn about marriage by only studying divorce."

This same research supports using both systems to improve safety—each has its own merits. It isn't a case of "out with the old and in with the new," but creating a balance of the good and bad. Both systems can peacefully coexist.

The origins of this new concept–called Safety II–is deeply rooted in improving safety in the health care industry. Safety II is a significant mind shift moving from "as few things as possible go wrong" to ensuring that "as many things as possible go right."

As explained in "From Safety-I to Safety-II: A White Paper" (Hollnagel E, Wears R.I., and Braithwaite J.), "this perspective relates to the system's ability to succeed under varying conditions." In this model, humans are a resource necessary for system flexibility and resilience.

For pilots, this concept moves from identifying the occasional human error to finding those practices where, day-in and day-out, crews adapt and adjust to successfully mitigate threats and trap errors.

Recognizing that sound operating procedures are the basis of safe operations, there are those scenarios that take a flight crew “off script” or are displaced from center. The strength of the resilient pilot is to recover from these distractions caused by weather, mechanical delays, system malfunctions, or other factors. Cognition—the ability to learn, adapt, and adjust—is a strength of the human mind. As an industry, we can leverage these lessons and learn from difficult situations where things go right.

The concept of learning from what people do right is catching on. Jon Holbrook, a cognitive scientist at the NASA Langley Research Center, leads a team of researchers that study routine performance and how humans actively contribute by creating safety in complex systems. In a recent article, Holbrook said, “For every well-scrutinized accident, there are literally millions of flights in which things go right, and those flights receive very little attention.”

Resilience has been identified as an attribute that contributes to successful systems, according to Hollbrook and his team at the NASA Engineering and Safety Center. His team has found parallels between resilient systems and humans. “Resilient people can adapt to new circumstances and bounce back from adversity, while a resilient system can adjust its functioning to keep operating despite changes and disturbances,” said Holbrook.

The mental processes that support resilient behavior is a new frontier in safety science. Holbrook’s project and an additional one at Embry-Riddle Aeronautical University have goals to better understand how humans anticipate, monitor, learn, and respond to challenges and disturbances. One desired outcome is to more deeply understand just how pilot’s behaviors contribute to safety.

It’s a little “tongue and cheek,” but the work of a safety professional is self-defeating. In this perfect utopian universe, there would be no work. It’s a noble goal to have zero accidents, but along with that comes fewer opportunities for discoveries. For the aviation safety community, its healthy to investigate new systems that are proactive and continuously anticipate developments and events.

Let’s give it a shot and celebrate those successes where ordinary flights become extraordinary due to outstanding pilot performance.

Study: Commercial air travel is safer than ever

The rate of passenger fatalities has declined yet again in the last decade, accelerating a long-term trend.

It has never been safer to fly on commercial airlines, according to a new study by an MIT professor that tracks the continued decrease in passenger fatalities around the globe.

The study finds that between 2008 and 2017, airline passenger fatalities fell significantly compared to the previous decade, as measured per individual passenger boardings — essentially the aggregate number of passengers. Globally, that rate is now one death per 7.9 million passenger boardings, compared to one death per 2.7 million boardings during the period 1998-2007, and one death per 1.3 million boardings during 1988-1997.

Going back further, the commercial airline fatality risk was one death per 750,000 boardings during 1978-1987, and one death per 350,000 boardings during 1968-1977.

“The worldwide risk of being killed had been dropping by a factor of two every decade,” says Arnold Barnett, an MIT scholar who has published a new paper summarizing the study’s results. “Not only has that continued in the last decade, the [latest] improvement is closer to a factor of three. The pace of improvement has not slackened at all even as flying has gotten ever safer and further gains become harder to achieve. That is really quite impressive and is important for people to bear in mind.”

The paper, "Aviation Safety: A Whole New World?" was published online this month in *Transportation Science*. Barnett is the sole author.

The new research also reveals that there is discernible regional variation in airline safety around the world. The study finds that the nations housing the lowest-risk airlines are the U.S., the members of the European Union, China, Japan, Canada, Australia, New Zealand, and Israel. The aggregate fatality risk among those nations was one death per 33.1 million passenger boardings during 2008-2017. Barnett chose the nation as the unit of measurement in the study because important safety regulations for both airlines and airports are decided at the national level.

For airlines in a second set of countries, which Barnett terms the "advancing" set with an intermediate risk level, the rate is one death per 7.4 million boardings during 2008-2017. This group — comprising countries that are generally rapidly industrializing and have recently achieved high overall life expectancy and GDP per capita — includes many countries in Asia as well as some countries in South America and the Middle East.

For a third and higher-risk set of developing countries, including some in Asia, Africa, and Latin America, the death risk during 2008-2017 was one per 1.2 million passenger boardings — an improvement from one death per 400,000 passenger boardings during 1998-2007.

"The two most conspicuous changes compared to previous decades were sharp improvements in China and in Eastern Europe," says Barnett, who is the George Eastman Professor of Management at the MIT Sloan School of Management. In those places, he notes, had safety achievements in the last decade that were strong even within the lowest-risk group of countries. Overall, Barnett suggests, the rate of fatalities has declined far faster than public fears about flying.

"Flying has gotten safer and safer," Barnett says. "It's a factor of 10 safer than it was 40 years ago, although I bet anxiety levels have not gone down that much. I think it's good to have the facts."

Barnett is a long-established expert in the field of aviation safety and risk, whose work has helped contextualize accident and safety statistics.

Whatever the absolute numbers of air crashes and fatalities may be — and they fluctuate from year to year — Barnett has sought to measure those numbers against the growth of air travel.

To conduct the current study, Barnett used data from a number of sources, including the Flight Safety Foundation's Aviation Safety Network Accident Database. He mostly used data from the World Bank, based on information from the International Civil Aviation Organization, to measure the number of passengers carried, which is now roughly 4 billion per year.

In the paper, Barnett discusses the pros and cons of some alternative metrics that could be used to evaluate commercial air safety, including deaths per flight and deaths per passenger miles traveled. He prefers to use deaths per boarding because, as he writes in the paper, "it literally reflects the fraction of passengers who perished during air journeys."

The new paper also includes historical data showing that even in today's higher-risk areas for commercial aviation, the fatality rate is better, on aggregate, than it was in the leading air-travel countries just a few decades in the past.
"The risk now in the higher-risk countries is basically the risk we used to have 40-50 years ago" in the safest air-travel countries, Barnett notes.

Barnett readily acknowledges that the paper is evaluating the overall numbers, and not providing a causal account of the air-safety trend; he says he welcomes further research attempting to explain the reasons for the continued gains in air safety.
In the paper, Barnett also notes that year-to-year air fatality numbers have notable variation. In 2017, for instance, just 12 people died in the process of air travel, compared to 473 in 2018.

"Even if the overall trend-line is [steady], the numbers will bounce up and down," Barnett says. For that reason, he thinks looking at trends a decade at a time is a better way of grasping the full trajectory of commercial airline safety.

On a personal level, Barnett says he understands the kinds of concerns people have about airline travel. He began studying the subject partly because of his own worries about flying, and quips that he was trying to "sublimate my fears in a way that might be publishable."

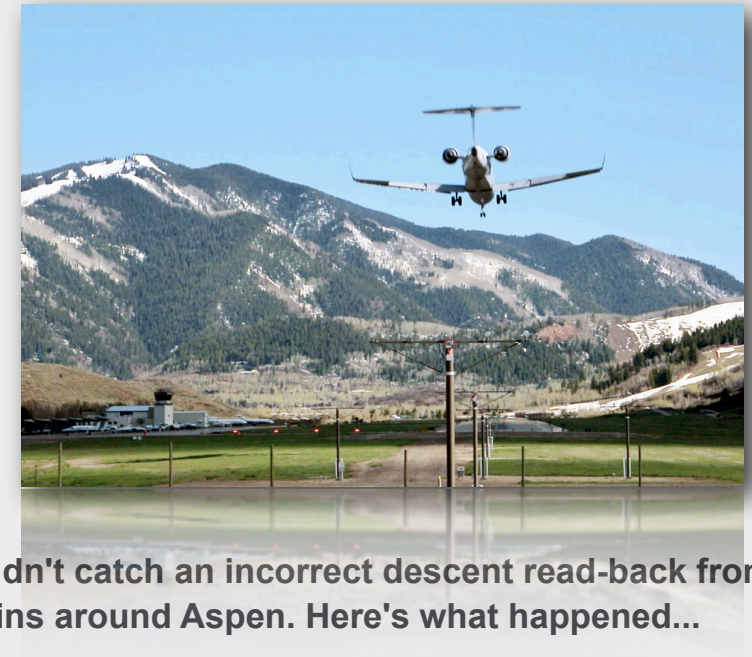
Those kinds of instinctive fears may well be natural, but Barnett says he hopes that his work can at least build public knowledge about the facts and put them into perspective for people who are afraid of airplane accidents.

“The risk is so low that being afraid to fly is a little like being afraid to go into the supermarket because the ceiling might collapse,” Barnett says.

http://dx.doi.org/10.1287/trsc.2019.0937

Pilot Reads Back Incorrect Altitude While Descending Into Aspen

ATC just cleared you to descend to 13,000 feet over the mountains of Colorado. *You read back 10,000 feet and they don't catch the mistake.* What now?



Jet Descending Into AspenWhile many articles have been focused on pilot reports, NASA ASRS reports are filed by air traffic controllers too. In this example, a controller didn't catch an incorrect descent read-back from a crew flying into the mountains around Aspen. Here's what happened...

Working as the "Controller in Charge" for the operation, I was over-viewing the operation on both sides of the tower cab.

The approach controller was dealing with an aircraft operating 10 miles out on the localizer at an altitude unfavorable for a visual approach. ***While deciding to re-sequence another aircraft back around, the approach controller had issued a descent to the second aircraft with a bad read-back due to what I believe was expectation bias.*** *We will call the aircraft with a missed read-back "Aircraft X."*

I also did not hear the incorrectly assigned altitude. The approach controller issued a descent to 13,000 feet and the pilot read back 10,000 feet. He was not reissued the correct altitude to maintain. The attention of the controller and myself was taken away from Aircraft X while we dealt with another IFR arrival and a VFR aircraft in the pattern. The approach controller observed Aircraft X descending through 12,400 feet (below the MVA for the area) and issued a low altitude alert and instructions to climb immediately.

Aircraft X responded and reported field in sight requesting the visual approach. The approach controller issued the visual clearance to the requested runway. Aircraft X landed safely with no issues. With relatively clear weather, this mistake did not result in disaster. However, under the right conditions, this could have been an extremely dangerous situation with high terrain surrounding Aspen.

MVA: Minimum Vectoring Altitude

An MVA is the lowest altitude that ATC can vector you around a particular section of airspace. Approach and Center controllers can divide their scopes into small sections of airspace, separating obstacles and terrain from areas with lower vectoring altitudes. When radar coverage is available from an approach or center facility, MVAs are a great way to get as low as possible over a VFR airport. **But unfortunately, MVAs aren't published on your IFR charts.**

You can, however, find MVAs published online. Click here for FAA MVAs and MIAs. Keep in mind, these drawings aren't easy to decipher and unless you're an ATC controller, and figuring out where an airport is located on an MVA chart can be difficult.

Contributing Factor: Expectation Bias

Most of the time, pilots read back clearances correctly. And if either party doesn't hear the read-back clearly, they ask for it to be repeated. Since ATC was accustomed to aircraft following instructions as-stated, there likely wasn't a pressure to double-check that the pilots were following the proper clearance.

Controllers are far more familiar with the minimum IFR altitudes around their particular airports than the pilots flying in and out.

Expectation bias is a real threat to all of us in aviation, whether we're pilots or air traffic controllers. When we expect to hear or see something, our minds have a tendency to trick us into thinking we've accomplished the stated goal.

What Can You Do?
In this case, the best thing the pilots could have done was cross-check their descent clearance with the height of terrain below or immediately around them. Since MVAs aren't easily accessible, there's not much else you can do to ensure ATC gives you a correct instruction.

As for listening skills, pilots and controllers need to pay extra attention to descent clearances around terrain. If either party misunderstands or doesn't clearly hear the read-back, they should ask for clarification. If you start to feel external pressure, slow down to cross-check your work. The more pressure you're under, the more likely you are to make a mistake.

https://www.boldmethod.com/learn-to-fly/regulations/how-to-file-NASA-ASRS-reports/

https://www.faa.gov/air_traffic/flight_info/aeronav/digital_products/mva_mia/

Panel Urges Mandatory Safety Systems for Aircraft Manufacturers

An expert committee recently recommended the Federal Aviation Administration's require Boeing Co and other aircraft manufacturers to adopt new safety management tools in the wake of two fatal Boeing 737 MAX crashes.Boeing grounded its entire 737 Max fleet, halting deliveries of its best selling commercial airliner after an Ethiopian Airlines flight crashed in March last year.

It was the second 737 Max to crash in a matter of months. A Lion Air plane crashed in Indonesia in October, 2018.

A total of 346 peopled died in the two crashes.The expert panel, led by a retired Air Force general and a former head of the Air Lines Pilot Association, also called for improvements in how the Federal Aviation Administration certifies new planes. But it did not back ending the long-standing practice of delegating some certification tasks to aircraft manufacturers.

The panel, which was named by Transportation Secretary Elaine Chao in April, recommended the FAA mandate Safety Management Systems (SMS) for “design and manufacturing organizations.” The FAA currently requires Safety Management Systems for airlines.

The special committee report release said “unlike the current certification system’s focus on compliance, SMSs foster a holistic assessment of whether the combinations of actions such as design, procedures, and training work together to counter potential hazards.”

Boeing’s safety culture was harshly criticized last week after it released hundreds of internal messages about the development of the 737 MAX, including one that said the plane was “designed by clowns who in turn are supervised by monkeys.”

FAA Administrator Steve Dickson said last year he wants to move “toward a more holistic versus transactional, item-by-item approach to aircraft certification.”

U.S. House Transportation Committee chairman Peter DeFazio last month said his panel’s review of the fatal crashes found “a broken safety culture within Boeing and an FAA that was unknowing, unable or unwilling to step up, regulate, and provide appropriate oversight of Boeing.”

The special committee said new aircraft testing “should include multiple failure mode scenarios and involve trained pilots who reflect a representation of the anticipated end-users of the product.”

National Transportation Safety Board chairman Robert Sumwalt said in September that crews in the two fatal crashes “did not react in the ways Boeing and the FAA assumed they would.”

The special committee said the FAA should propose to the International Civil Aviation Organization (ICAO) “the sharing of operational data internationally to enhance safety.”

The report also said the FAA needs an “aggressive recruitment campaign to encourage students to pursue careers at the FAA” and should address “concerns about potential undue pressure” on Boeing employees conducting FAA certification tasks.

The Justice Department and Transportation Department’s Office of Inspector General are both investigating the 737 MAX certification.

Danger on the Tarmac: Family Sues American Airlines Over Dangerous Conditions After Luggage Cart Driver Killed in Charlotte

Kendrick Hudson died on Aug. 2 when he swerved to avoid a piece of luggage on the tarmac and his baggage-hauling vehicle rolled. The City of Charlotte is also named in the lawsuit.

The family of a man killed in August in a luggage cart accident at Charlotte International Airport is suing American Airlines and taking aim at the industry after a string of tarmac deaths over the last decade.

The Corpus Christi law firm of Hillard Martinez Gonzales LLP filed the suit after Kendrick Hudson died on Aug. 2 when he swerved to avoid a piece of luggage on the tarmac and his baggage-hauling vehicle rolled. The City of Charlotte is also named in the lawsuit.

At least 15 workers have been killed working for commercial airlines on U.S. tarmacs since 2010, including five in 2019, according to the law firm's research. A congressional aviation subcommittee held a hearing last week on the safety of ground workers, spotlighting a part of the airline industry where employees work in tough outdoor conditions, sometimes drive tugs without seatbelts and repetitively lift heavy bags.

Hudson was the only American Airlines employee among ground worker deaths during the last decade, but several have been working for major airlines and carriers such as Delta Air Lines and United, as well as cargo carriers such as UPS and FedEx. Dallas-based Southwest Airlines paid $2 million in a settlement over the 2012 death of ramp agent Jared Dodson, who was killed when he was struck by a mobile lounge at Washington D.C.'s Dulles International Airport.

Hudson was a baggage handler and driver in Charlotte for Piedmont Airlines, a subsidiary of Fort Worth-based American Airlines. Charlotte is one of American's most important hubs, with about 700 departures a day there.

"Our condolences are with the family of Mr. Hudson," said a statement from American Airlines spokesman Joshua Freed. "Safety is our No. 1 priority and the first consideration in every decision we make and we are committed to providing a safe work environment for all of our team members."

Freed said an investigation into the accident by the Occupational Safety and Health Administration is not yet complete and “no cause has been determined.” State investigations into the accident also are ongoing.

The lawsuit, which only addresses Hudson’s death, said it was “so dark in that area that he could not see the dropped piece of luggage in front of him until he was almost on it – too late for him to safely avoid it.”

Hudson’s abdomen, pelvis and legs were pinned underneath the vehicle and he had multiple fractures from the accident, according to the suit.

“American Airlines knew of the inadequate lighting, and the danger it presents to all those working in the area, yet they chose to stick their head in the sand, as Mr. Hudson and other personnel continued to work in dangerous conditions,” said Alex Hilliard, a lawyer for Hudson’s family.

The area in which the accident occurred is outside Charlotte’s E Concourse.

The case was filed in North Carolina state court.

Protect your plane and tools with your fingerprint

Just introduced is Tapplock one+, a padlock that unlocks with a fingerprint.

The padlock allows users to access their items in 0.8 seconds and has an adaptive algorithm that allows the lock to become faster and more accurate with each use, according to company officials.

Since it is common for people to share access to a padlock, the Tapplock one+ can store up to 500 fingerprints to allow multiple users to access the lock without having to pass along a combination or key.

Users also can use the Tapplock app to track who opened the lock and when, or to grant mobile access via a remote unlock feature.

The Tapplock one+ features a 7mm reinforced stainless-steel shackle, strengthened by double-layered lock design with anti-shim and anti-pry technologies.

The smart padlock has an IP67 water-proof rating that allows the lock to function even when completely submerged. It also is dust and rust-proof and is fully functional between -4° and 140° Fahrenheit.

The lock's battery lasts up to a year off a single charge, which equates to around 3,500 unlocks per charge, and users can check the remaining power using the Tapplock app, company officials explain. The lock also blinks red when the power is below 10%, indicating it is time for a recharge.

http://www.tapplock.com/

About English in Global Aviation

Taking readers step-by-step through the major issues surrounding the use of English in the global aviation industry, this book provides a clear introduction to turning research into practice in the field of English for Specific Purposes (ESP), specifically Aviation English, and a valuable case study of applied linguistics in action. With both cutting-edge research and evidence-based practice, the critical role of English in aviation is explored across a variety of contexts, >

including the national and global policies impacting training and language assessment for pilots, air-traffic controllers, ground staff, and students.

English in Global Aviation teaches readers how to apply linguistic research to real world, practical settings. The book uses a range of corpus-based findings and related research to provide an effective analysis of the language needs of the aviation industry and an extended look at linguistic principles in action. Readers are presented with case studies, transcriptions, radiotelephony, and a clear breakdown of the common vocabulary and phrasal patterns of aviation discourse. Students and teachers of both linguistics and aviation will discover the requirements and challenges of successful intercultural communication in this industry, as well as insights into how to teach, develop, and assess aviation English language courses.

https://www.bloomsbury.com/uk/english-in-global-aviation-9781350059306/

CBS Sunday Morning : Dreams Do Come True!

Third grader Henry Boyer, of Howell, Michigan, was so blown away by the University of Michigan marching band that he wrote a letter to them saying how he'd love to sign up someday – approximately in 2029. Their response struck a major chord in this young man's life. Steve Hartman reports.

https://www.youtube.com/watch?v=YLzasdVaBBg