Aviation Human Factors Industry News

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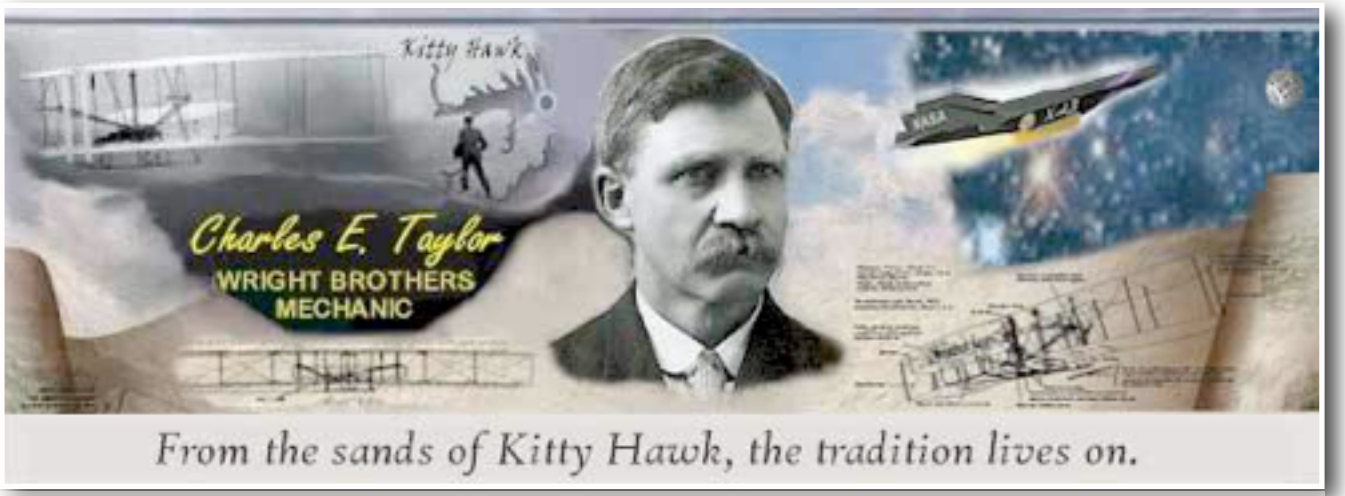


Hello all,

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:

‘2012 best in history of safety improvements by airlines’

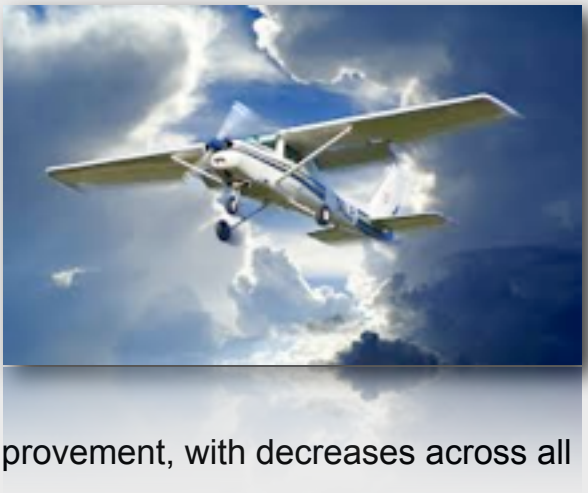
The International Air Transport Association (IATA), air transport body for global airlines, has said that the 2012 global accident rate for Western-built jets was the lowest in aviation history.

The 2012 global Western-built jet accident rate measured in hull losses per million flights of Western-built jets was 0.20 percent, the equivalent of one accident in every five million flights. According to figures released by IATA, this represented a 46 percent improvement over 2011, when the accident rate was 0.37 percent, or one accident for every 2.7 million flights.

But Africa still remains poorest among other continents, in terms of safety improvements as its safety performance declined in 2012 compared to 2011 from 3.27 percent to 3.71 percent.

“Africa is a continent divided on performance. Airlines on the IATA Operational Safety Audit (IOSA) registry are performing at or above industry average rates.”

NTSB: GA Accident Rate Flat



The NTSB this week released preliminary aviation accident statistics for 2012, showing that Part 121 commercial airline operations remained fatality-free, and general aviation accidents were virtually unchanged. In the general aviation segment, the number of total accidents was 1,470 in 2011 and 1,471 in 2012. Fatalities decreased slightly, from 448 to 432, and the accident rate per 100,000 flight hours declined from 6.84 to 6.78. On-demand Part 135 operations showed improvement, with decreases across all measures, the NTSB said.

The safety board has been advocating for a change in the general aviation safety rate for several years, citing the failure to improve and a tendency for the same causes to recur over and over again.

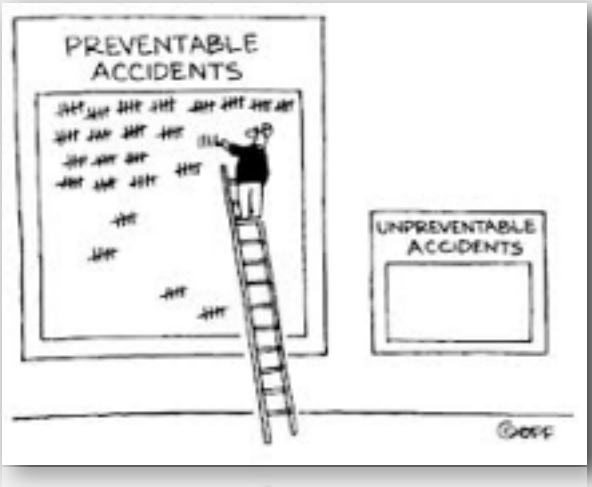
The NTSB recently issued a series of five online videos addressing the major causes of GA accidents. The 2012 statistical tables showing accidents, fatalities and accident rates for major segments of U.S. civil aviation are posted online.

http://www.avweb.com/avwebflash/news/Full-NTSB-Video-Safety-Series-Now-Online220326-1.html

http://www.ntsb.gov/data/aviation_stats.html

Plane crash that killed 2 pilots 'a preventable accident'

A series of pilot errors and an improperly secured engine oil cap caused a plane crash that killed two pilots near Vancouver International Airport in October 2011, the Transportation Safety Board said Wednesday as it released its investigation findings into the accident.



TSB spokesman Bill Yearwood said the oil cap was left unsecured during routine maintenance but wasn't detected because there was no pre-flight inspection of the aircraft.The Beech King Air 100 twin-engine aircraft reversed course 15 minutes after departing for Kelowna after it detected an oil leak in the left engine.

But the plane plummeted onto No. 2 Road in Richmond, less than a kilometre from the airport, and burst into flames.

The pilot, 44-year-old Luc Fortin of North Vancouver, died hours after the crash of fire-related injuries. His co-pilot Matt Robic, 27, died from his injuries three weeks later.

The TSB findings concluded impact-related injuries sustained by the pilots limited their ability to extricate themselves from the aircraft when it caught fire.

Eight people survived the crash but suffered injuries including burns, spinal fractures and one mild brain injury.

Yearwood said the pilots could have survived the crash if it wasn't for the fire. He said Transport Canada failed to put recommendations in place from his board to reduce post-crash fires.

Six survivors are suing the airline for damages, saying crew members from Northern Thunderbird Air Inc. willingly ignored the apparent oil leak prior to takeoff.

Yearwood said passengers alerted flight crew to oil underneath the wing, but their concerns weren't acted upon.

The engine manufacturer issued a bulletin in 1995 recommending a modification to the oil cap to limit oil loss when it isn't secured properly – but that fix was never made.

New technology to measure radiation exposure in pilots

Researchers from the University of Wollongong have developed a unique device that measures how much radiation pilots and astronauts are exposed to.

The silicon-based microdosimeter assesses the radiation risk to astronauts and pilots, and radiation damage to microelectronics, during long-term space missions and high altitude flights.
Exposure to too much radiation can cause cancer, damage to the foetuses of pregnant women and genetic defects that can be passed onto future generations.

Professor Anatoly Rozenfeld, Director of the Centre for Medical Radiation Physics (CMRP) - the largest research body of its kind in the Asia Pacific region - has just been granted a US patent for his invention.

"Silicon microdosimetry is providing a new metric for the estimation of hazards from ionizing radiation in mixed radiation fields.

It is an essential contribution to radiation protection of pilots and astronauts in avionics and space, where the radiation environment is not easy to predict," Professor Rozenfeld said.

Professor Rozenfeld and his multidisciplinary research team at CMRP have worked with a number of high profile international agencies, such as the National Space Biomedical Research Institute (USA), the United States Naval Academy, the Australian Nuclear Science and Technology Organization (ANTSO) and the Australian National Fabrication Facility at UNSW, on the invention.

"We are confident that this version of 3D silicon microdosimeter after final investigation of prototype will be very attractive for commercialization in many fields of terrestrial and space radiation protection," Professor Rozenfeld said. Professor Rozenfeld, who has dedicated his life to finding better treatments for cancer after losing both parents to the disease, said the technology could also be used in advanced radiation oncology modalities (such as proton and heavy ion therapies) for cancer treatment.

FAA Proposes $2.75 Million Civil Penalty Against Boeing Co. for Quality Control Violations

The U.S. Department of Transportation's Federal Aviation Administration (FAA) is proposing a $2.75 million civil penalty against Boeing Co.'s commercial airplanes unit for allegedly failing to maintain its quality control system in accordance with approved FAA procedures.

"Safety is our top priority and a robust quality control system is a vital part of maintaining the world's safest air transportation system," said U.S. Transportation Secretary Anthony Foxx. "Airplane manufacturers must take prompt and thorough steps to correct safety and compliance problems once they become aware of them."
In September 2008, Boeing discovered that it had been installing nonconforming fasteners on its model 777 airplanes. On October 2008, the FAA sent Boeing a letter of investigation that requested a response within 20 working days.

The FAA alleges that Boeing repeatedly submitted action plans that set deadlines for the accomplishment of certain corrective actions, but subsequently failed to implement those plans. The company implemented a plan to address the fastener issue on Nov. 10, 2010, more than two years after Boeing first learned of the problem

“Manufacturers must make it a priority to identify and correct quality problems in a timely manner,” said FAA Administrator Michael Huerta. Boeing stopped using the nonconforming fasteners after officials discovered the problem. However, some of the underlying manufacturing issues continued to exist until after the corrective action plan was in place.

Boeing has 30 days from the receipt of the FAA’s civil penalty letter to respond to the agency.

FAA Sends Letter To Pilots Re: Medications

The FAA is sending a letter and fact sheet to all U.S. pilots to make them aware of the potentially negative effects that certain types of common over-the-counter and prescription drugs could have on the safety of flight. Specifically, the FAA notes the "sedative effects" caused by "many medications" and the ability of some medications to cause cognitive impairment. It also emphasizes the "subtle degradation of the ability to competently evaluate actual IMPAIRMENT [sic]" caused by some medications. According to the FAA, medications that are prohibited by the agency are found to be a factor in roughly 12 percent of fatal GA accidents. Along with those warnings, the FAA also offers guidance.The letter lists four ways that pilots can reduce the risk of being impaired by medication. It asks pilots to educate themselves by reading documentation and asking their doctor about medications they are using, specifically with regard to their impact on the performance of complex tasks like flying. The FAA warns pilots not to fly until at least five maximal dosing intervals have passed. That translates to waiting 30 hours to fly after taking a medication that can be administered every four to six hours.

The agency asks pilots to apply the illness, medication, stress, alcohol, fatigue, emotion checklist (IM SAFE) and step back from flying activities if the checklist suggests you may be distracted or impaired in your assessment or decision-making due to use of any medication. Finally it reminds pilots that expert guidance is available from designated FAA Medical Examiners.

Find the full text of the letter online here (PDF).

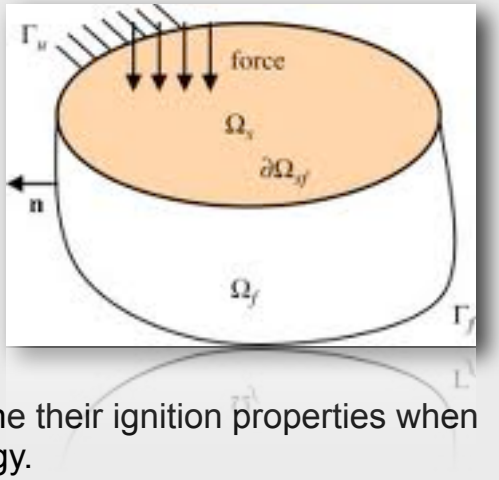
OSHA Safety Regulations Demand Hazmat Training

Thousands of flight department employees, such as aircraft maintenance technicians, will be required by December 1 to take U.S. government-mandated hazardous material (hazmat) training to help them identify and protect themselves against potentially hazardous materials and situations.The new OSHA regulations are designed to align U.S. practices with the United Nations' globally harmonized system of classification and labeling of chemicals. In the universal system, for example, a signal word–such as "Danger" for more severe hazards, or "Warning" for less severe threats–is used on labels, along with a variety of pictograms and hazard statements describing the nature of the hazards. Labeling of hazardous materials must also include first-aid measures to cope with a spill should one occur, as well as contact information for the chemical's manufacturer.

Report Studies Link between Vibration and Battery Fires

The July 24 report by the United Arab Emirates' General Civil Aviation Authority (GCAA) on the Sept. 3, 2010 crash of a UPS Boeing 747 in Dubai urges operators of the Boeing freighter to consider the role aircraft vibrations and the acoustical energy they generate might play in onboard lithium-ion battery fires.

While GCAA investigators suspect an onboard battery fire brought down the aircraft, they did not pinpoint the cause in their conclusions.The GCAA said the FAA, working with the European Aviation Safety Agency and Boeing, should evaluate the Class E cargo compartments of freighter/combi Boeing 747s for a phenomenon called “structural acoustic coupling,” which might cause instability in lithium battery electrolytes. The GCAA also urges the NTSB, FAA and EASA to test lithium batteries to determine their ignition properties when subjected to external sources of mechanical energy.



In October 2010 the FAA issued a safety alert warning operators that Halon 1311 is ineffective in fighting fires that ignite in large quantities of lithium-ion batteries such as those carried in cargo containers. The FAA subsequently restricted carriage of lithium batteries in bulk on passenger flights.

http://www.ainonline.com/aviation-news/ain-air-transport-perspective/2013-07-29/ups-fire-safety-steps-respond-2010-crash

http://www.ainonline.com/aviation-news/2010-09-07/smoke-filled-cockpit-ups-pilots-attempted-return-dubai

Electronic Distractions by John Goglia

Texting during critical phases of flight has put renewed emphasis on the dangers of distraction in the cockpit, particularly from the personal use of electronic devices, such as cellphones, tablets and laptop computers.The recent NTSB finding that an EMS helicopter that crashed in 2011 was caused at least in part by a pilot texting during critical phases of flight has put renewed emphasis on the dangers of distraction in the cockpit, particularly from the personal use of electronic devices, such as cellphones, tablets and laptop computers. Four people were killed in that accident.

Although Congress and the FAA have decided to focus rulemaking on eliminating distractions caused by these personal electronic devices in airline flight decks, the problem of these distractions is just as significant in the hangar and anywhere maintenance is performed, whether performed by an airline or repair station employee or a general aviation mechanic.

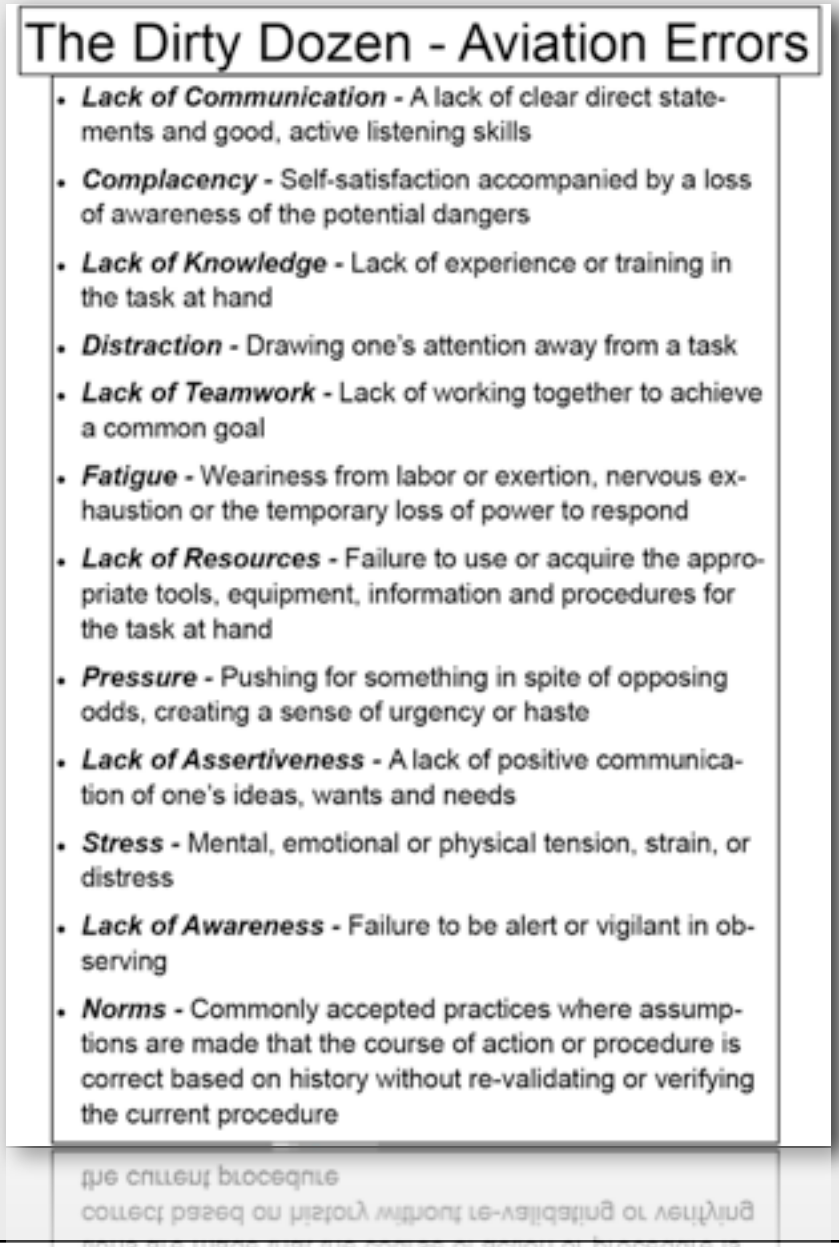
While I have not heard of an accident specifically traced to a maintenance technician's use of a cellphone or other electronic device, it seems to be just a question of time before that happens. We already know that distractions are a leading cause of mistakes in aircraft maintenance.

Based on a number of maintenance-related accidents in the 1980s and early 1990s, Transport Canada (the Canadian version of the FAA) created a list of the most common sources of maintenance errors, the so-called Dirty Dozen. I'm sure most of you are familiar with them. In that list, distraction ranks as number four, after lack of communication, complacency and lack of knowledge. Distraction is defined by the FAA on its human factors web site as: one's attention is drawn away; mental or emotional confusion or disturbance occurs. When working among many people, with frequent work interruptions, or when coping with stress, it is easy to become distracted.

When this list of maintenance human factors errors was developed, cell phones were not yet common in the general population as they are today. It would have been the rare mechanic to have a cell phone in his or her pocket in those days. Today, it's probably fair to say that it would be rare to find a mechanic without a personal cell phone. Unfortunately, those cell phones are now a frequent cause of distraction while maintenance is being performed. Even though many companies prohibit cell phone use while mechanics are working, my observation is that enforcement of those policies is spotty at best.

Even at major airlines that prohibit cell phone use on the job, mechanics can be seen talking or texting while performing maintenance. I was recently visiting the maintenance department of a major airline and observed a mechanic working on an engine pause, reach in his pocket, answer his cell and then continue on with his engine work.

It's unlikely that the FAA will have a rule any time soon prohibiting personal electronic devices from intruding on maintenance workers. (The proposed rule prohibiting the use of personal electronics on the flight decks of airlines is still in the proposal stages.) But mechanics and repairmen shouldn't wait for such a rule; they need to turn off their cell phones before doing any maintenance work on an aircraft. The risk of fatal distraction is just too great.

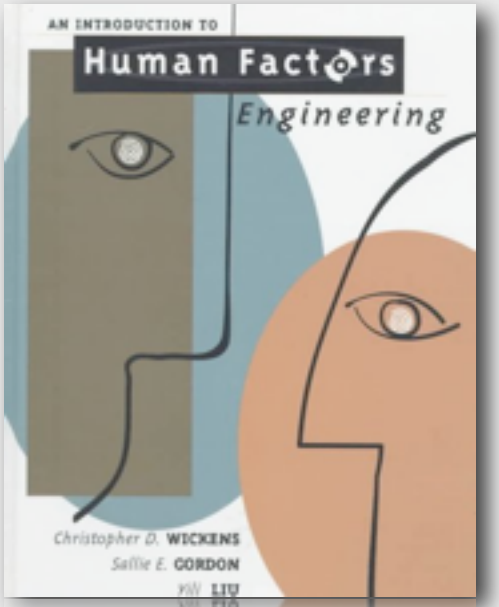


EASA Refines Human Factors Competencies For Inspectors

EASA explores enhanced human factors training

Travel around the world, or even within a single country, and you'll find human factors principles applied unevenly in aviation maintenance due, in part, to uncertainties among maintenance leaders and inspectors as to what this field is all about.

"Not everyone understands human factors," says Simon Roberts, chairman of the European Human Factors Advisory Group and a 15-year veteran of the U.K.'s Civil Aviation Authority, where he currently serves as safety management systems program coordinator. "Some academics give the impression that you need to understand psychology and the science of the mind to get it, but I argue it is just people being people. Human factors is just what we do on a daily basis."



This lingering confusion about the field was the impetus for the European Aviation Safety Agency 's (EASA) proposal to develop human factors competencies for the various functions of regulators, beginning with aviation maintenance inspectors, as outlined in its European Aviation Safety Plan 2013-16.

"One of the things I'm trying to do is make sure we don't overcomplicate what human factors is. I'm trying to bring it down to the realities of life," says Roberts.

He likens the understanding of human factors to understanding our relationship to speed limits. We all break the speed limit from time to time. The question is: Why are we taking that risk? Are we late? Distracted by our cell phones? Angry? Tired and not paying attention? Human factors is simply about understanding the underlying 'why' behind a lapse and, if necessary, putting checks in place to mitigate the risk in the future.

Roberts says he became aware of the knowledge gap through informal discussions with inspectors and via feedback from some maintenance organizations expressing concern about inspectors not probing as deeply as the organizations thought they should. The problem, he explains, is a lack of confidence in the subject matter, which manifests as a tendency to do a surface-level examination rather than asking the right questions.

For instance, a diffident inspector will often look at whether technicians have been trained in this area and equate training with understanding. However, someone with a more in-depth knowledge of human factors would dig deeper and look at whether training is being applied in daily activities.

Similarly, they do not simply look at whether errors are being reported, they examine the type of errors reported.

Are technicians limiting their reports to things like a printer not working or a third-party provider delaying a part delivery? Or are they reporting safety-related errors, process problems and, importantly, identifying their own mistakes? Does the right culture exist to encourage this kind of error accountability?

"The more competent you are on a subject, the more likely you are to delve deeper into it," Roberts says. "Regulators need a holistic view so they are not looking only at compliance, but at whether the human factors program is actually delivering." Although he speaks from a U.K. perspective, the principles are universal.

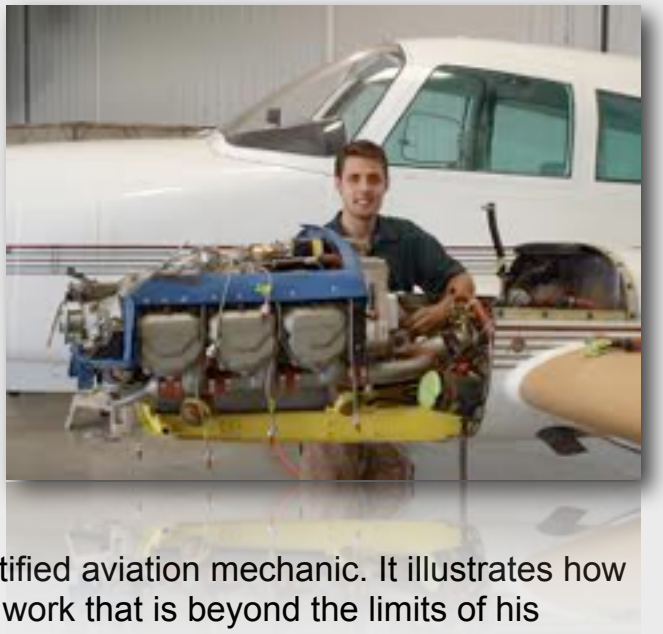
To bring about that holistic understanding in inspectors and others, Roberts and his team will create a list of key human factors competencies, along with the level of understanding needed for critical areas of these factors. When the competencies are defined, a tailor-made training program can then be designed. The approach is a nod to a broader industry shift toward competency-based training rather than the traditional route, which tends to be measured by topic and training hours.

While the process to define the competencies has not yet started, Roberts says his group agrees that there will be an emphasis on the ability to ask open and meaningful questions. Human factors knowledge will certainly be the foundation, but beyond that, inspectors will need to demonstrate proficiency in their ability to assess the effectiveness of a human factors program in an organization. They must know, for instance, how to talk to mechanics, pilots and others about the sorts of things they feel comfortable reporting to their organization and how long it has been since they last reported something. Inspectors will also be primed to interpret the attitudes and behaviors they observe.

Once the competency framework is defined, EASA will look at applying it to European safety regulations-a move that will improve the overall level of human factors programs throughout Europe, Roberts predicts.

Human factors training "is more than just giving [inspectors] better questions to ask; it is understanding the responses and knowing whether and how to challenge those responses to understand whether an organization is really applying human factors ," Roberts says. "It is knowing where and how deeply to look and how to recognize what 'good' looks like."

The Mechanics Creed



The Mechanics Creed was originally written by Jerome Lederer in 1941. The creed appeared on the back cover of the first issues of Flight Safety Foundation's Aviation Mechanics Bulletin in 1953 and proved to be extremely popular. Mechanics around the world, "from Tokyo to Frankfurt, from Canada to Puerto Rico," wrote to request copies to hang in their offices and shops. It cites our responsibilities to hold on to our sacred trust in the rights and privileges conferred upon us as a certified aviation mechanic. It illustrates how we pledged never to take or approve work that is beyond the limits of his knowledge, nor allow an unqualified person to persuade him to approve an aircraft or equipment as airworthy against his better judgment.

Please read the creed below and remember the importance of what we do and the responsibilities we have to everyone who fly's. UPON MY HONOR I swear that I shall hold in sacred trust the rights and privileges conferred upon me as a certified mechanic. Knowing full well that the safety and lives of others are dependent upon my skill and judgment, I shall never knowingly subject others to risks which I would not be willing to assume for myself, or for those dear to me. IN DISCHARGING this trust, I pledge myself never to undertake work or approve work which I feel to be beyond the limits of my knowledge nor shall I allow any non-certified superior to persuade me to approve aircraft or equipment as airworthy against my better judgment, nor shall I permit my judgment to be influenced by money or other personal gain, nor shall I pass as airworthy aircraft or equipment about which I am in doubt either as a result of direct inspection or uncertainty regarding the ability of others who have worked on it to accomplish their work satisfactorily. I REALIZE the grave responsibility which is mine as a certified airman, to exercise my judgment on the airworthiness of aircraft and equipment. I, therefore, pledge unyielding adherence to these precepts for the advancement of aviation and for the dignity vocation.

Communication

Everyday we communicate in many different ways. We communicate verbally, with body language, hand signals, and written text. The way we perceive the information, especially when a wrong or incomplete communication was sent, could have serious safety consequences.

Here are some examples of real life miss communication: Instructions to accomplish a task that contains more than one part, (Such as an EO) without stating which part is to be completed could result in the wrong part being accomplished. Not complying with instructions, that do not appear to be required, could result in missing a safety inspection. Failure to properly communicate about, or verify hand signals while taxing or towing an aircraft could result in aircraft damage.

Each of us has a responsibility to ensure the communication that is received is the one that was sent. If a maintenance task has multiple parts, verify which part is required. If an assigned work task does not appear to be required, verify it before you consider it “not applicable.” When receiving hand signals while taxing an aircraft, verify to the best of your abilities that you are receiving the proper signal.

Proper communication is a two way process. Failure to properly send or receive a communication could have serious safety consequences.

Runway Safety Flash Cards

How good is your knowledge of runway signage and markings? Refresh your memory now with FAA's newly released Runway Safety Flash Cards and Quick Quiz for mobile device users of http://www.faa.gov/mobile/. The new page features flippable runway signage and markings flash cards that change when you re-orient your mobile device. After you brush up on the flash cards, you can test your knowledge of runway indicators with a quick quiz.

http://www.faa.gov/mobile/

Safety Is a Choice: DuPont James River Site

Video: Safety Is a Choice: DuPont James River Site

Help Needed for 35th Annual GA and Part 135 Activity Survey

The 35th annual General Aviation and Part 135 Activity Survey (GA Survey) for reporting on calendar year 2012 has begun! Please help the FAA provide accurate information on aviation activity and aviation safety.

The FAA's annual GA Survey is the only source of information on the size and makeup of the general aviation and Part 135 fleets, the number of hours flown,

and the reasons people fly. All rotorcraft have been selected to participate in this survey to help the FAA understand the activity of these high-use, high-end aircraft. These data help to determine funding for infrastructure and service needs, assess the impact of regulatory changes, and measure aviation safety.

The GA Survey is also used to prepare safety statistics and calculate the rate of accidents among general aviation aircraft.

You can complete the survey on line, or a survey form will be mailed to you along with a postage-paid envelope.

Why is your participation important?

• The FAA needs your help so that they can prepare accurate estimates of aviation safety. Data from this survey are used to calculate fatal accident rates for general aviation and Part 135 aircraft.
• They need to hear from everyone! Please respond, even if you did not fly your aircraft during 2012, you sold it, or the aircraft was damaged.
• Your responses are confidential. Tetra Tech is an independent research firm that conducts the GA Survey on behalf of the FAA. The information will be used only for statistical purposes and will not be published or released in any form that would reveal an individual participant.
• A short version of the survey form is available for owners of multiple aircraft.

Your time is valuable. If you have any questions, or if you own three or more aircraft and receive several surveys, please contact Tetra Tech toll-free at 1-800-826-1797 or email infoaviationsurvey@tetratech.com.

Caffeine Significantly Reduces Crash Risks for Commercial Drivers

Long distance commercial drivers who consume caffeinated substances are significantly less likely to crash than those who do not, even though they drive longer distances and sleep less, according to a new case-control study by researchers from Australia.

Drivers who consumed caffeinated substances such as coffee or energy drinks, in order to stay awake while driving, had a 63% reduced likelihood of crashing, compared with drivers who did not take caffeinated substances.

The case-control study was conducted between 2008 and 2011 in New South Wales and Western Australia. Participants were long distance drivers whose vehicle mass was at least 12 tons. The study compared 530 drivers who crashed their vehicle while on a long distance trip (cases) with 517 drivers who had not had a crash in the previous 12 months (controls).According to the study, 43% of drivers reported consuming substances containing caffeine, such as tea, coffee, caffeine tablets, or energy drinks for the express purpose of staying awake. In addition, 3% reported using illegal stimulants such as amphetamine ("speed"), methylenedioxymethamphetamine (ecstasy), and cocaine.

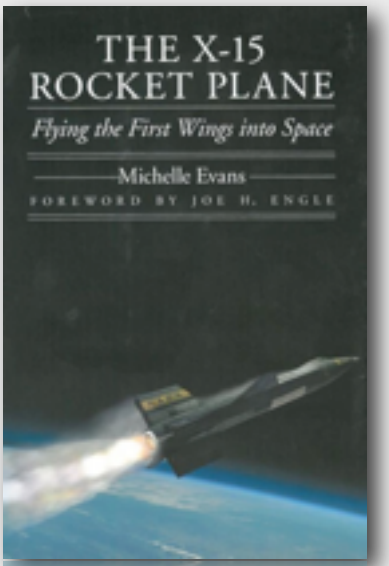
"The study shows that the consumption of caffeinated substances can significantly protect against crash risk for the long distance commercial driver," said lead author Lisa Sharwood, a research scholar with The George Institute at the University of Sydney. "The benefit, however, is likely to be short-lived. Having regular breaks, napping and appropriate work schedules are strongly recommended in line with national fatigue management legislation for heavy vehicle drivers."

Researchers believe drivers are making behavioral adaptation in order to manage their fatigue. "This may seem effective in enhancing their alertness, but it should be considered carefully in the context of a safe and healthy fatigue management strategy; energy drinks and coffee certainly don't replace the need for sleep," Sharwood said.

The full study is available on the BMJ Journal website.

http://www.bmj.com/content/346/bmj.f1140

X-15 pilots blazed path for Space Shuttle flights



With the Soviet Union's launch of the first Sputnik satellite in 1957, the Cold War soared to new heights as Americans feared losing the race into space. The X-15 Rocket Plane tells the enthralling yet little-known story of the hypersonic X-15, the winged rocket ship that met this challenge and opened the way into human-controlled spaceflight.Drawing on interviews with those who were there, Michelle Evans captures the drama and excitement of, yes, rocket science: how to handle the heat generated at speeds up to Mach 7, how to make a rocket propulsion system that could throttle, and how to safely reenter the atmosphere from space and make a precision landing.

This book puts a human face on the feats of science and engineering that went into the X-15 program, many of them critical to the development of the Space Shuttle. And, finally, it introduces us to the largely unsung pilots of the X-15. By the time of the Apollo 11 moon landing, thirty-one American astronauts had flown into space—eight of them astronaut-pilots of the X-15. The X-15 Rocket Plane restores these pioneers, and the others who made it happen, to their rightful place in the history of spaceflight.

The Peril of Skipping breakfast

Nearly one in five adults in the U.S. say they frequently miss breakfast, and new research suggest they may be endangering their hearts. Harvard School of Public Health researchers interviewed nearly 27,000 middle-aged and older men about their eating habits, and then tracked their health for 16 years.

They found that those who regularly skipped breakfast were nearly 30 percent more likely to have a heart attack or to die from heart disease in that period then those who - regardless of whether they exercised, smoked or overate.

Researchers say skipping breakfast may stress the body in ways that raise blood pressure and the likelihood of diabetes; they say eating erratically can throw circadian rhythms out of whack, making our bodies less efficient at processing food and increasing risk of obesity and heart disease. Previous research has shown that people who eat late at night have a 55 percent higher risk of heart disease. Eat in the morning when you wake up, preferably within an hour," study author Leah Cahill tells *BBCNews.com.* "Something is better than nothing, but it's always better to have something healthy and balanced."

Inspiration

"There's a sunrise and a sunset every single day, and they're absolutely free. Don't miss so many of them."

-Jo Walton