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WRIGHT BROTHERS MECHANIC
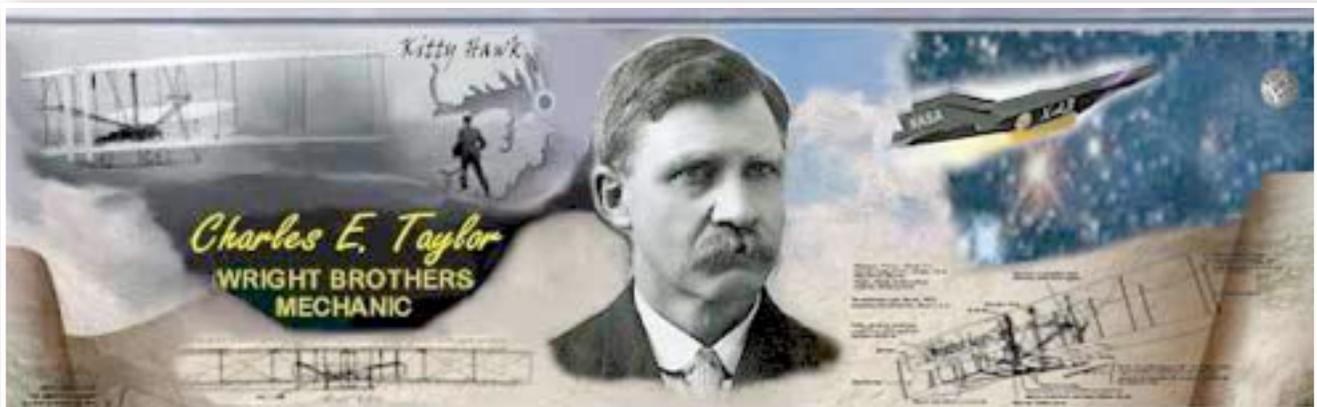
From the sands of Kitty Hawk, the tradition lives on.

Hello all,
To subscribe send an email to: rhughes@humanfactorsedu.com
In this weeks edition of *Aviation Human Factors Industry News* you will read
the following stories:

★**Would Pilot 'Panic Button' Save the Day or Tie Hands**

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Would Pilot 'Panic Button' Save the Day or Tie Hands?

Cockpit-equipment maker Rockwell Collins Inc. is devising the ultimate emergency device for pilots about to crash.

When they push a "panic button," onboard computers grab control and return the plane to safe and level flight. Rockwell Collins officials spelled out their plans for these "digital parachutes," as they are also known, at the Paris Air Show this. The concept, drawn from experience with unmanned aircraft and basically requiring only software revisions, has sparked an industry debate on the proper limits of aircraft autonomy.

In the next year or two, Rockwell Collins engineers intend to add such automated protections to the company's "Pro Line" family of avionics on some business jets. Eventually, emergency buttons are even expected to show up on certain airliners, though the company declined to specify which models.

"This level of automation, redundancy and ability to recover will become ubiquitous," said Dave Vos, the Rockwell Collins official leading the project. "It's a lot closer than many people are willing to recognize."

On Wednesday, a company spokeswoman said "this is something we intend to incorporate" into some cockpit designs and "introduce into the marketplace in the next couple of years."

Many independent safety experts are skeptical, and some dismissive—as are some rivals.

"Safety people count on the human to think and take control" in emergencies, said Denis Bonnet, a senior cockpit designer at French equipment-supplier Thales SA. As a pilot, he added, "I would like the system to help me, not replace me."

Emergency buttons and similar safety systems have been installed on some fighter jets for many years, specifically to save aircraft and lives if military pilots become disoriented while performing violent maneuvers. In some popular Airbus single-aisle jetliners with Rockwell Collins gear, computers already sense and react to cabin depressurization. If the cockpit crew fails to react rapidly enough, the computers command a sudden descent. That feature has been approved by aviation regulators and is being phased into the production process, with few arguments.

But with its latest efforts, Rockwell Collins is navigating uncharted territory. Company experts envision automation saving the day in many more types of emergencies. By linking a single, all-purpose panic button to engine thrust, movements of control surfaces and commands of flight-management computers, Rockwell officials believe they can come as close as possible to creating fail-safe crash prevention.

The proposed systems won't prevent crashes when planes have lost lift or end up flying dangerously slowly close to the ground, Mr. Vos said. Rather, the aim is to have automation kick in to ensure that aircraft at higher altitudes can escape peril when pilots lose awareness of their situation or end up in deadly stalls or flight upsets, the most common categories of accidents for today's advanced jets.

In the unlikely case of dual engine failure, hitting the button would activate navigation aids and automatic guidance to the nearest appropriate runway. The same automation could fly and autonomously land an aircraft with an incapacitated pilot.

Some experts consider top-of-the-line Bombardier Inc. business jets strong contenders. But a Bombardier spokesman on Wednesday said the manufacturer had "no plans to use this technology at this time."

The skepticism stems partly from the fact that cockpit automation, no matter how sophisticated, sometimes doesn't work precisely as anticipated. When pilot don't understand what computers are doing, "automation can be the source for many difficulties," cautions Patrick Goudou, Europe's chef aviation-safety regulator. Speaking about such general threats, Mr. Goudou told an U.S-European safety conference in Vienna last week that "we must be conservative in approving new systems; we need to simplify, rather than add more complexity."

Marion Blakey, former chairman of the U.S. National Safety Board and currently head of the Aerospace Industries Association, an Arlington, Va., group of plane and equipment makers, is cautiously supportive of the concept. Since commercial aviation can't tolerate pilot mistakes that end in crashes, she said, the Rockwell Collins approach "could have huge potential."

Pilots may need "to see these kinds of systems come into play," she said earlier this week, when aircraft performance indicates "this is not normal, this is not right."

Hawker Beechcraft removes conference room chairs, aims to improve productivity

Many of you have probably said it - too much of your day is spent sitting in meetings. Well, Hawker Beechcraft is doing something to change that, and they're doing it by getting rid of, what's normally, a conference room necessity. "The comment came directly from the employee group - we would like to meet less often and when we have meetings we'd like them to be shorter and more productive," explains Shawn Vick, Executive Vice President. So being the innovative company it needs to be, Hawker has started removing chairs from 80% of the conference rooms in the plane maker's headquarters.

And only days into the new system Vick says it's working. "Sometimes even the smallest of decisions pop out as good things to do, and quite frankly, it's been well received and quite frankly has resulted in people becoming efficient and more productive."

So how about it? Would you trade your chair for shorter meetings?

Vick adds, "The people at Hawker Beechcraft are a pretty resolved group. I think this is here to stay."

Hawker may even take this a step further. There's been talk of installing kitchen timers to ensure meetings don't run long.

Chairs are still provided for anyone who can't physically stand for a long period of time. The company hopes the move could also improve the health of their employees. Standing reduces the strain on the lower back and burns more calories.

$243,360 in Fines Issued to Maine Contractor for Fall Hazards

OSHA inspectors found four Lessard employees exposed to potentially life-threatening falls of 23 feet while working without fall protection on a steep-pitched roof at a work site in Lewiston, Maine. A Lewiston, Maine, roofing contractor faces a total of $243,360 in proposed fines from OSHA following a January inspection that resulted in citations for alleged egregious willful, serious, and repeat violations for a lack of fall protection and other hazards. OSHA previously had cited Lessard Brothers Construction Inc. and its predecessor, Lessard Roofing & Siding Inc..., 10 times for fall protection violations at various Maine work sites. Due to management's knowledge of the hazard and the required safeguards, along with the company's extensive history of violations, Lessard was cited for four egregious willful violations with $224,000 in proposed fines.

"This employer ignored the law and put workers' lives at risk," said Assistant Secretary of Labor for OSHA Dr. David Michaels. "OSHA's commonsense regulations save lives. Employers who ignore these regulations and endanger their employees will face the consequences."

"Falls are the number one killer in construction work," said Marthe Kent, OSHA's New England regional administrator. "Employees in situations such as this are just one slip, trip or misstep away from a fatal or disabling fall. Responsible employers must ensure that effective fall protection measures are in place and in use every day on every job site."

This significant enforcement action qualifies Lessard Brothers Construction for OSHA's Severe Violators Enforcement Program, which mandates targeted follow-up inspections to ensure compliance with the law. Initiated in 2010, SVEP focuses on recalcitrant employers that endanger workers by committing willful, repeat or failure-to-abate violations.

Cell Phone: Weapon of Mass Distraction

The other day, I was stopped at the traffic lights and when the lights turned green, the car in front of me would not go. I didn't honk, I just used my inside voice and waited. When the car finally went, I passed it and realized that the was talking on a cell phone. I told myself that the driver must have been distracted and had not realized that the traffic lights had changed. This incident may be mundane; however, if you Google the Web to find hazards related to the use of cell phones, you will find hundreds of websites talking about health and safety issues. A majority of the websites relate to new legislations banning the use of cell phones when driving cars. Those dealing with aviation almost exclusively relate to the restrictions in the use of cell phones by passengers. Surprisingly there was very little published on the use of cell phones during aircraft maintenance.

I scoured the Canadian Forces (CF) publications to find out if we had any specific policies and started to ask questions. I did not find a "cell phone policy" but I was advised that cell phones fall into the Foreign Object Damage (FOD) category. That makes sense; however, I was still not convinced that a cell phone is limited FOD. When I think of FOD, I think of an inanimate object. A cell phone is different; it has a ring to it. So I got in touch with Transport Canada to find out if there was a civilian regulation pertaining to the use of cell phones during aircraft maintenance. The answer was straightforward. The use of cell phones in a maintenance environment falls in the category of distraction or interruption: a common cause for maintenance errors. The idea is that, when responding to a cell phone, a person leaves the task (both physically and/or mentally) and returns' thinking that he/she is further along with the task. I also learned that interruptions are thought to be responsible for about 15% of all maintenance errors.

So cell phones are more than FOD, they are considered a distraction. When you come to think of it, we are all conditioned to answer the cell phone. Just as Pavlov's dogs... The ringing or vibration of a telephone has become one of our currently most powerful interrupters. You see it everywhere – drivers will answer the phone while speeding along in five o'clock traffic, technicians will climb down from work stands to take a call.

Even when we have no intention of answering, the urge to look at the "caller-ID", just a quick peek, can be very distracting and lead to errors even for the most meticulous and experienced technician. An interruption can attract our attention away from any form of activity. In aircraft maintenance, this can result in disaster.

Distractions and interruptions are a normal part of our everyday life. In the aircraft maintenance environment, it is paramount to develop ways to mitigate and minimize the risks that may be induced by them. Well-written, detailed work procedures, and checklists are a great tool for keeping track of where we are, or where we were, on a given task when the interruption occurred. Training can help you remember to keep your mind on the task at hand. Treat all distractions and interruptions as red flags. In fact, knowing that we are all vulnerable to interruptions can help reduce that vulnerability.

Implementing a cell phone use policy could address the problems linked with their use during maintenance (i.e., interruptions). Such a policy could be considered a novel idea but it already exists within the United States Air Force Material Command (AFMC). AFMC Instruction 21-122 states that:

- Cell phones will not be used while driving any vehicle.
- Personnel are prohibited to use cell phones while performing any type of aircraft maintenance operations.
- Cell phones will not be used in production areas, around active maintenance, or at any time around flammable liquid or fumes, cartridge-activated devices, propellant-activated devices, or any armed component to include ejection seats.
- Cell phones will be stored in personal lockers while not in use

Should the CF implement a similar policy? There may be some value. For one thing, it does not leave much to interpretation. It also addresses other known technical hazards. For example, it prohibits the use of cell phones in and around cartridge activated devices and armed components.

The reason for this decision is related to the fact that the electro-magnetic emission of a cell phones can interfere with aircraft systems and Electro-Explosive Device (EED) such as rocket fuses, explosive detonators, missiles and similar ordnance, on or off aircraft. Although many efforts are made to protect EEDs against all sorts of radiations, no system is completely immune (C-09-153-003/TS-000). The AFMC policy also prohibits the use of cell phones near flammable liquid or fumes. While there appears to be no documented cases linking cell phone use to explosions at gas stations (Safety Digest, 4/2007), the prohibition likely stems from the potential for distraction in a dangerous environment.

What is the urgency for implementing such a policy? The fact that technicians are bringing "live" cell phones to the servicing line is a concern that needs to be addressed by the maintenance leadership. An example to illustrate the point is the case where a technician lost his cell phone and decided to dial the number in an attempt to locate it. Sure enough, a CP-140 Aurora pilot found the "ringing" phone under his seat during the startup procedure. Beyond the obvious FOD hazard, the "ringing" could have occurred during a critical phase of flight leading to much worst consequences.

Cell phones have become an integral part of our lives, and are often used as a lifeline for our loved ones to reach us. But these phones are beasts that we need to tame. To reduce the risks, we need to be proactive and address the potential hazards by building defences. Until a pan-CF policy is issued, the best thing to do is to leave your cell phone in your locker (or your car).

While at work, rather than relying on your cell phone for home-emergencies, simply leave another phone number (i.e. servicing desk) where a message can be taken and relayed to you. This way you and your co-workers will be able to focus on the job without interruptions that can induce errors with serious consequences.

What is resilience engineering?

In the past 20 years, experts in the safety and human factors fields have been crystallizing some of the patterns that they saw when investigating disasters and failures in the "high risk" industries: aviation, space travel, chemical manufacturing, healthcare, etc. These patterns formed the basis for resilience engineering. They all surround the concept that a resilient system is one that can adjust its functioning prior to, during, and after an unexpected or undesired event. There is a lot that web development and operations can learn from this field because the concepts map easily to the requirements for running successful systems online. One of the pieces of resilience engineering that I find fascinating is in the practical realization that the "system" in that context isn't just the software and machines that have been built to do work, but also the humans who build, operate, and maintain these infrastructures. This means not only looking at faults — or the potential for faults — at the component level, but at the human and process level as well.
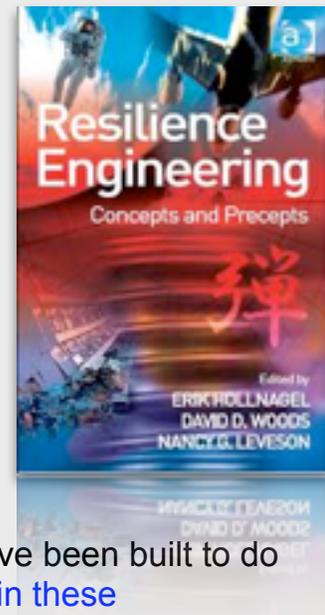
This approach is supported by a rich history of complex systems enduring unexpected changes only because of operator's adaptive capacities. I don't think I've felt so inspired by another field of engineering. As the web engineering discipline matures, we should be paying attention to research that comes from elsewhere, not just in our own little world. Resilience engineering is an excellent example of that.

Dynamic Glare Reduction Science

Inventor Chris Mullin, with help from the Air Force, is developing smart sunglasses that identify the brightest spots in a wearer's field of view, dynamically darken that specific area, and follow the light source, leaving the rest of the view less affected. The glasses work by putting liquid crystal displays in the lenses. That technology is coupled with a pinhole camera sensor and built into the frame. Together they identify glare and react by applying more sun filtering to the LCD in that area of the lens, even as the wearer turns his or her head. In practice, wearers see a dark non-opaque spot hovering over the sun, or any other source of glare that exceeds a programmed threshold. The prototype is still relatively bulky and may challenge popular fashion sense, but the concept has earned attention (and funding) from the Air Force.

Both the Air Force and Army have subsidized inventor Chris Mullin's efforts through annual six-figure Small Business Innovation Research contracts that he's won for the past six years. The military initially pushed the design toward darker lenses, but when they asked for clear lens options, Mullin recognized other potential markets. The glasses currently use batteries, but Mullin imagines one day offering solar-powered units. The inventor estimates that he's about $5 million away from an initial run of 24,000 consumer glasses he says he could have built in about one year. He estimates the initial product could hit the market at a retail price close to $500. If the technology is met with demand, Mullin believes the cost of the technology could drop, allowing prices to fall closer to $200/pair.

Why the team in red often wins

Glimpsing the color red makes us stronger and faster, at least momentarily, a new study says. Researchers at the University of Rochester had undergraduates clench a handgrip the instant they saw the word "squeeze" appear on a computer screen. When the word popped up in red, the students squeezed both harder and more quickly than they did if the word appeared in blue or gray.

A test on elementary and high school students yielded similar results. The simple experiment offers further proof that humans are hardwired to pick up on red "as a danger cue," study author Andrew Elliot tells *ScienceDaily.com.* Since "Humans flush when they are angry or preparing for attack," he explains, they "Are acutely aware of such reddening in others and its implications. "But while seeing red may improve our muscular performance in the short term, it also takes a mental toll.

Previous studies have shown that athletes facing a red-clad team then to lose, and students who see red before a test perform worse that those who don't -in part because they find the color stressful and distracting. Yet we rarely notice the impact red has on us, Elliot says: "Those color effects fly under our awareness radar."

A380 VS. EMBRAER'S BUILDING

It was well known on opening day at the Paris Air Show that the Airbus A380 demo plane had "brushed" a building and wouldn't be able to fly but it wasn't clear exactly what had happened. Well, the accompanying photo, which are circulating on the Internet but appear to have originated at AirlineReporter.com, give a little context to the conflict between giant airliner and building. That's Embraer's building getting the renovation, by the way. The aircraft was moved under its own power to a discrete area of the airport where Airbus officials who aren't busy selling airplanes are plotting their next move. Airbus says the pilots followed Le Bourget ground instructions for taxiing but it's not the first time the super jumbo hasn't been able to keep its wings to itself with the nosewheel on the centerline (see next page).

OUCH!