

# Aviation Human Factors Industry News

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

Hello all,

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

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## US industry voices concerns about aerospace workforce

US aerospace chiefs are increasingly worried about [sustaining a viable aerospace industry workforce](#), they told a Washington DC summit last week.

[“We’re short 500 mechanics,”](#) AAR Corp chairman and CEO David Storch said at the US Chamber of Commerce 11<sup>th</sup> Annual Aviation Summit D.



The company does roughly 3.8 million hrs. of maintenance a year. “Each of us has the obligation and responsibility ... to make sure that future workforce is out there for us,” he said. Initiatives such as getting the younger generation excited about aviation, as well as investing in training and working with local institutions, are measures that may be critical to the industry going forward. [“We don’t pay attention](#) here, we won’t have an industry,” Storch said.

Airbus Americas chairman T. Allan McArtor added, “We do have an obligation to be actively involved. We have to generate first the interest ... then we have to shape the curriculum and course content.”

Rockwell Collins chairman, president and CEO Clayton Jones said, “Most of the very large, iconic businesses ... are not in a good position in terms of hiring and growing because of the defense side of it. That’s going to ultimately hurt all of aviation.”

He added, [“We have to stop the bleeding](#)—no matter what side you are—of significant reductions.”

## Mind the gap

A human behavior expert says the Pike River mining tragedy shows we still [haven’t learned why smart people repeatedly make dumb mistakes - with disastrous results.](#)

Andrew Laxon reports It was an accident waiting to happen, Dr Kathleen Callaghan told the Pike River mining tragedy inquiry. The Auckland University [human factors expert](#) didn't mince her words as she told the Royal Commission last November what she thought of the company, the inspectors and the whole legal, commercial and political environment which made some kind of disaster highly likely. The Pike River mine explosion, which killed 29 miners in November 2010, was an [organizational accident](#), she said, in the same category as the 1986 Chernobyl nuclear reactor meltdown, the BP oil spill in the Gulf of Mexico in 2010 and - New Zealand's own benchmark - the Mt Erebus tragedy which killed all 257 crew and passengers on an [Air New Zealand DC10](#) in 1979.



It stemmed from failures at Pike River Coal but even more importantly, from failures in the Department of Labour, which was supposed to ensure safety in the mine, and by the Government, whose decisions had weakened the inspectors' effectiveness.

Callaghan's evidence was overshadowed at the time by a staggering series of revelations to the commission, which finished its final hearings this week and is due to report in September.

But her comments briefly drew attention to the fact that the tragedy was not just a mining accident. As she argued at the inquiry, it was caused by [repeated human error on a large scale](#), which has disturbing implications for all New Zealanders.

Callaghan is the director of Auckland University's human factors group, which starts from the premise that human beings - and their tendency to make mistakes - [are at the centre](#) of everything we do, especially in the workplace.

Sitting in a former ward room near her office in the old Auckland Hospital building, she explains it's the study of why apparently smart people do stupid things, often time and time again and even after they've been told not to. The answers tend to involve uncomfortable truths about how we really behave, often for hidden reasons that we may not want to admit.

The 46-year-old was sidetracked into human factors and accident investigation through a love of flying as a young doctor. Posted to Dubbo in the New South Wales outback in her first year as a would-be neurologist, she became hooked on gliding and promptly signed up for an aviation medicine career with the Royal New Zealand Air Force.

Her masters thesis examined how fear of crashing affected the decisions of air force fighter jet pilots to hit the ejector seat button. Using a simulator, she discovered that pilots generally made the right decision above the 10,000 feet ejection safety threshold but made [increasingly over-cautious choices](#) to abandon their aircraft the closer they got to the ground. As a result of her work, the air force decided not to lower the threshold after all.

She later became principal medical officer of the Civil Aviation Authority, and in a joint PhD in medicine and psychology examined the unofficial reasons behind doctors's decisions about their patients.

"They're the ones we all know like 'I'm short of time', 'I'm worried that they might take me to the Health and Disability Commissioner', 'Mrs X won't get her operation unless I say she fell over'. If we don't acknowledge them and try to deal with them, how do we expect diagnostic decisions to be any better?"

The most common knee-jerk reaction to an accident, she says, [is finding someone to blame](#). If a patient dies after a nurse accidentally gives the wrong drug the easy answer is to blame the nurse. But she may have been distracted, tired or misread the doctor's poor handwriting and each underlying reason could lead to a different solution.

Callaghan says this does not mean letting people off. A good company has a ["just culture"](#) which strikes a balance between encouraging workers to report safety failures without fear of reprisals and reserving the right to take disciplinary action against those who consciously disregard the rules.

Suppose we both drink and drive tonight, she says. "I could make it home scot free, you kill somebody. And there's an element of chance to that... But the conscious disregard is your decision to drink and drive."

Apparently small problems can also have huge consequences. Everyone is familiar with getting into a different car and, in busy traffic, accidentally switching the windscreen wipers on when you meant to indicate. Callaghan says a fatal 1995 plane crash near Hamilton occurred partly because the pilots were flying an aircraft identical to the one they normally used, [except for the fuel management system](#). "Some people died there but the underlying action is the same as you (mistakenly) flicking the windscreen wipers."

Another common knee jerk response is [improved training](#), which she says has become a catch-all corporate response to failure, even though most of us already know when we're doing something wrong.

An apparently crazy decision by a factory worker who removes a safety guard and loses his arm is the same kind of choice we make each time we jaywalk across a busy street.

"The choice I make is not wait at the pedestrian lights or die. It's normally something like 'I'm late for a meeting and it's my boss' - so I dodge through traffic."

Callaghan says it's also unrealistic to say that staff should speak up if everyone knows they will be punished, openly or otherwise, for doing so. This culture of saying one thing but doing another frequently leads to dangerous shortcuts.

"We call them '[routine violations](#)', where the rule says 'x' but everyone does it another way. Everybody's aware that they're doing it another way, including supervisors, and you just get on.

"When the shit hits the fan, that's when somebody invokes the rule again and decides to take out the individual rule-breaker."

Erebus had a strong element of that, she says.

On the face of it, Captain Jim Collins went below the minimum descent altitude and crashed into the mountain. But several pilots - supported by a company brochure - said Air New Zealand [routinely ignored the rule](#) to give passengers a better view.

Even the Costa Concordia sinking off the coast of Italy in January may stem from more than just the actions of its notoriously cowardly commander, Captain Francesco Schettino.

Subsequent reports have revealed the company had approved an even closer "sail by" in August, many lifeboats could not be launched because the ship was tilting too sharply and new passengers had not been given a safety drill.

Callaghan's final tip is to [avoid making new rules for the sake of it](#). "We often see solutions implemented before the problem's been defined and then people run around going 'But it's not working'."

Callaghan and her colleague Bridget Mintoft say that, increasingly, some businesses understand their ideas and can see benefits beyond safety. For instance, Mintoft is researching how long personal investors are willing to stick with losing stocks under stress, which many firms could find directly useful.

It's not ivory tower science, says Callaghan, passionately. It's about understanding [how to get the best out of human beings](#) "which is actually really sexy". She laughs at her own enthusiasm. "If you do it right it can have an immediate positive effect on people. Whereas exhortations to pay more attention or just do it better or let's get rid of the bad bastards ... (she lowers her voice to a stage whisper) ... it doesn't actually get you anywhere."

## The Blind Spot

In early January, a retired engineer named Roger Boisjoly passed away. The name is probably unfamiliar, but you might remember his role in the Space Shuttle Challenger disaster. The night before the Jan. 28, 1986 launch, Boisjoly argued late into the night against launching, insisting the unusually cold temperatures would cause the O-rings to fail. Unfortunately, he was up against the director of the Marshall Space Flight Center (MSFC), a man who had made it clear that under no circumstances would MSFC be the cause of a launch delay. Boisjoly **was overruled**, the Challenger launched, and Boisjoly was proved right just over a minute into the flight.

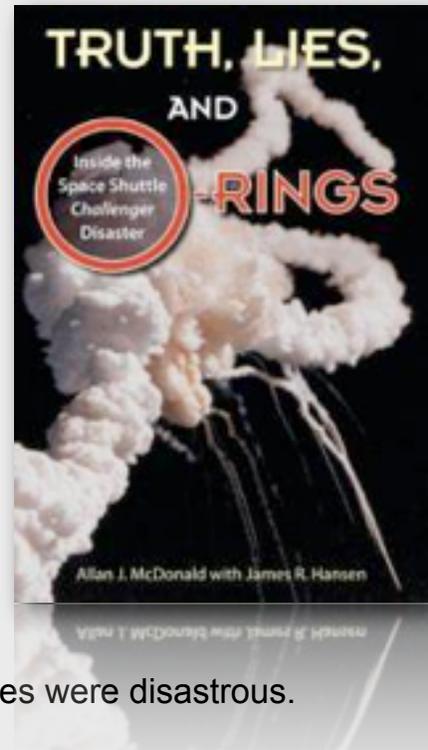
NASA had placed on-time performance above safety. In this case, and again 17 years later when Columbia burned up during re-entry, the consequences were disastrous.

As too many organizations, on-time performance and safety wind up wrestling for top billing. When that happens, safety will lose every time.

A key issue here is that most leaders aren't aware there's a wrestling match going on. "NASA truly believed safety was the number one priority getting the shuttles into the air." Says Jim Huggett, senior VP at Behavioral Science Technology (BST), a consulting firm that helps create injury-free workplaces. IT played a key role in evaluating NASA's culture following the Challenger disaster.

"The aviation community has the same challenge: they truly believe safety is their number one priority."

Just ask any airline executive what's most important to his or her operation. The answer likely will be safety. "The problem isn't that they don't believe in safety," says Huggett. "The problem is they have a cognitive bias to believe they are safe because they talk so much about it." The result: that cognitive bias creates a **blind spot**, and that blind spot prevents leaders from recognizing when there's a problem. If they don't believe there's a problem, they won't take steps to transform their culture into one that is genuinely founded on safety because they think they already have it.



There's a catch-22. Only an outside expert can determine whether a blind spot exist. But convincing leaders to invest in an evaluation is tough when they think a safety culture exists.

Short of bringing in an outside firm, what can companies do? [Leaders can start by examining what they say](#). They may think they toot the safety horn, but if they also press technicians to work extra shifts when they are tired, then safety messages are just words.

“Culture relates to what I’m told is important,” says Huggett. “If my boss keeps hammering me to get the planes out, then that’s where my focus is going to be. The senior leadership team must understand that the way they communicate to the organization creates a climate and over time influences how people think about things.”

The irony in all this is that focusing on short-term objectives such as on-time performance or a lower incident rate ultimately erodes organizational effectiveness.

On the other hand, companies that give day-to-day metrics a back seat to becoming a safe operation that cares about its people see performance sour. “If you lead with safety, because it is a values-based initiative, you’ll change the way people think about the organization and influence all your other metrics,” says Huggett. “You may not start a safety culture transformation to get less absenteeism, fewer union gripes and better teamwork, but you’ll get that.”

In other words, safety doesn't have to compete with other priorities - it enables them. In a Jan. 17 blog post after Boisjoly's death, BST CEO Colin Duncan wrote, “The future of safety will belong to those who develop an understanding of safety's presence, influence and importance in all aspects of operational life. When organizations are able to articulate the links between safety and other performance goals, safety becomes woven into the fabric of the organization rather than remaining on the sidelines, functionally discrete.”

## Ryanair Tells FAs To Lose Weight For Fuel Savings

### Using 'Girls Of Ryanair' Calendar As An Incentive To Slim Down

Check your calendar ... it's not April 1st. Ryanair has owned up to the fact that it is asking its female flight attendants to slim down as a way to



reduce its fuel costs, and using the chance to appear in a "Girls of Ryanair" calendar as an incentive. Ryanair says its all about the fuel, which is continuing to rise in price. Airline spokesman Stephen McNamara told the British newspaper The Independent that slimming down the FAs will result in "a significant reduction in weight," which translates in to fuel savings.

While female FAs are being told that losing weight will give them a chance to appear in its annual cheesecake calendar, there is no word on what incentive the male FAs are being offered to slim down.

Ryanair is also a strong proponent of asking heavier passengers to pay a higher fare ... a "fat tax" if you will ... for the privilege of flying on their aircraft.

## A Billion Calories Burned by 2020?

The American Heart Association has set that goal and encourages walkers to sign up and [have their calories tallied](#). "One in two men and one in three women are at risk for heart disease, and research shows that poor lifestyle is a major contributor," said AHA President Elect Donna Arnett, Ph.D. The American Heart Association has begun the "Billion Calorie Count-UP," describing it as "a new multi-year, nationwide goal aimed at encouraging Americans to collectively burn one billion calories by the year 2020." [Jennie Finch](#), a star softball pitcher who helped the U.S. women's softball team win a gold medal at the 2004 Summer Olympics in Athens, took part in the April 4 launch.



AHA will count the calories burned by individual walkers at Heart Walks nationwide and add them to the total.

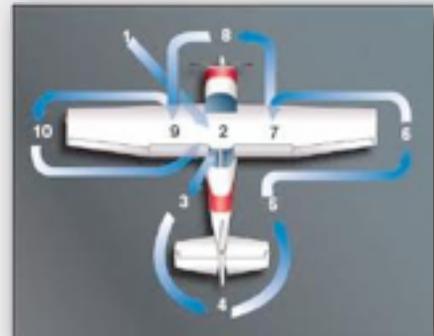
"When I was playing softball, I used to spend countless hours training to keep my body in top shape. That was my day job. Luckily, for most Americans, staying in shape is a lot simpler, and this year, it can [start with a brisk daily walk](#)," said Finch, who is also an AHA spokesperson. "I'm thrilled to be working with the American Heart Association to launch the 'Billion Calorie Count-UP' and supporting their commitment to improving the cardiovascular health of all Americans by at least 20 percent by the year 2020."

"Statistics show that research shows that poor lifestyle is a major contributor," said AHA President Elect Donna Arnett, Ph.D., professor and chair of Epidemiology at the University of Alabama at Birmingham. "From walking clubs and paths to cooking tips and easy-made recipes, the American Heart Association's 'My Heart. My Life.' healthy-living initiative is working to help individuals and families understand how to get active and eat healthy — all part of the American Heart Association's 2020 goal. Don't stop with signing up for Heart Walk; use the American Heart Association Walking Clubs and Walking Paths to keep you walking every day."

<http://www.heart.org/myheartmylife>

## **Safety Begins On The Ground**

While loss of control flights lead the pack when it comes to GA fatal accidents, NTSB accident data from 2000-2009 shows [poor preflight inspections](#) caused or contributed to 156 GA accidents and 41 fatalities. One way of shoring up your preflight skills is to follow the steps of an ["advanced preflight,"](#) a concept that Airworthiness Inspector Steve Keesey outlines in the March/April 2012 FAA Safety Briefing. "Advanced preflight is a program that helps aircraft owners and pilots become more aware of all the safety-related data pertaining to their," says Keesey. "In addition, it focuses on being more aware of who maintains your aircraft, and how to apply a detailed approach to your preflight based on a review of the aircraft's maintenance history."



For more on how an advanced preflight can increase your chances of a safe flight, be sure to read the article on page 18. [http://www.faa.gov/news/safety\\_briefing](http://www.faa.gov/news/safety_briefing)

## Air Force To Pilots: Slow Down

The Air Force is "the largest energy user in the federal government," last year added \$1 billion in costs due to rising oil prices and, now, a range of changes may be coming to help curtail that. The Air Force operates a fleet of 4,700 aircraft. To save fuel, pilots of some of those aircraft are being ordered to [fly higher and slower](#) on some missions, Stars and Stripes reported,. Diplomatic efforts have created more direct routes of travel and last year saved \$2.4 million, deputy assistant secretary of the Air Force for energy, Kevin Geiss, said. And the Air Force will update some aircraft with more efficient engines -- with more complicated results. For example, the cost-benefit accounting reported by Stars and Stripes says that [swapping engines](#) on KC-135s will incur a bill of \$278 million dollars spread over several years and translate to fuel savings of \$150 million over the life of the aircraft. In that case, the Air Force is forecasting other benefits.



According to Stars and Stripes, swapping out engines on the tankers will also save \$1.3 billion in maintenance costs while also improving fuel efficiency. Otherwise, simply flying C-17 transports [at 568 mph instead of 584 mph](#) is expected to bring more direct and immediate (if incremental) savings. Efforts like that have resulted in an average fuel consumption drop of about 4 percent since 2006, even as the Air Force has increased cargo operations by 27 percent over nearly the same term (five years). Air Force units in the Pacific are also independently implementing their own fuel-saving initiatives. The most successful ideas could be incorporated into Air Force regulations. One of those initiatives involves removing waste from everyday operations as represented by the carriage of large concrete blocks. Apparently some squadrons routinely carry the blocks sometimes called ["pet rocks"](#) to simulate the heavy equipment aircraft would normally deliver during real-world missions. Crews are also working to reduce the 400 to 450 pounds per hour an average C-135 will burn driving around on the ground, [by shutting down two engines](#) as soon as is practical, after landing. The aim for Pacific pilots is to cut fuel use by 10 percent over the next 10 years.

## **Study: Helicopters Improve Survivability for Critically Injured**

A new study from John Hopkins University published Wednesday in the [\*Journal of the American Medical Association\*](#) concludes that critically injured patients transported via helicopter to level I or level II trauma centers have a higher of survival than those taken by ground transportation. The study covers a total of 223,475 people, spanning 61,909 helicopter-flown patients and 161,566 who received ground transportation. After factoring in "multiple known," including propensity score matching, the study concludes that a larger percentage of people who experienced "major trauma" had improved odds of survival with a helicopter response (18.2 percent) versus 12.7 percent for ground services.



<http://jama.ama-assn.org/content/307/15/1602.short>