



## Aviation Human Factors Industry News

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### HUMAN FACTORS AND YOU

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As the aircraft has evolved with time, so has our understanding regarding the various complex systems that make up such a wonderful mode of transportation. We can now better anticipate and predict how different situations can impact and affect our flying machine and we can therefore engineer new methods for maintenance and repair. However, this has not been the case with the 'human' being. **Our individual persona still remains unpredictable and this brings us to what is now known as human factors, or more precisely, the study of human performance in aviation.**

History is replete with incidents (not only in air travel) where the **human element, with its limitations**, played major roles in the creation of **errors**, albeit unintentionally, that ultimately was responsible for such disasters. The phrase '**pilot error**' comes to mind all too quickly. But, careful investigations have revealed a whole new 'world' of **contributing factors**, that make the aforementioned just the 'tip of the iceberg'.



I have the good fortune of being a **Human Factors Working Group** delegate representing my station (FLLMX) and also being currently **enrolled in a Masters level program where I hope to specialize in Aviation/Aerospace System Safety and Human Factors in Aviation Systems**. The classroom lectures and what is gained from this forum are more than enhanced when I find myself in the working environment. **When it comes to practicing system safety, human factors take on a whole new meaning**. Our company has **Safety** as the first of five values by which it

lives and breathes. We all should regard this very seriously, for without it, nothing else would matter. Lest we forget, if we were meant to 'fly', we would have had 'wings'. **My personal life has also been impacted by all this as I see the need to take care of my mental and physical health, both of which are called upon in the darkest hour of night**.

Let us always be cognizant of our surroundings and **accept our limitations** as we practice our individual professions. **We will not live long enough to commit all mistakes possible, so we must learn from each other**. Until next time, **be safe in the 'region of risk'**.

## Loose Coupling Causes Tail Rotor Failure

**Eurocopter AS 365N Dauphin. Substantial damage. No Injuries.**

Winds were from the north at 15 kt, gusting to 25 kt, when the helicopter, facing southwest, lifted off from a hospital-rooftop heliport in Valparaiso, Indiana, U.S., for a medical services flight to Chicago, Illinois, on July 14, 2005. The pilot established a 4- to 6-ft hover and began a right pedal turn. Despite his continued application of right antitorqued pedal, however, **the helicopter stopped turning** when it reached a westerly heading, the NTSB report said.



**"The aircraft then went into a sudden and uncommented yaw to the left,"** the pilot told investigators. "I was unable to stop the yaw, and by the time I was heading 090 degrees, the tail hit a roof structure just west of the pad (and the aircraft) then **rolled on its right side.**" The pilot, physician, nurse and patient were not injured.

Examination of the helicopter showed that the fenestron –tail rotor- drive shaft had failed about 6 in. (15 cm) aft of the main gearbox. **The report said that the failure was caused by excessive play in the tail rotor shaft coupling, which had been installed improperly by the operator's maintenance personnel.**

## SAT Airlines receives warning regarding aircraft safety

The Sakhalin Regional Transport prosecutor's office issued **12 warnings** to SAT Airlines **regarding frequent mechanical problems with their airplanes.**

These warnings came as the result of an investigation concerning a recent mishap when the **nose landing gear of an An-12 failed to extend on approach** to Yuzhno-Sakhalinsk Airport.



The crew was eventually able to lower the nose wheel and safely landed the airplane. **The follow-up investigation by the prosecutor's office revealed that SAT aircraft experienced 12 serious problems in 2005, 9 in 2006, and 2 more during the first 3 months of 2007.**

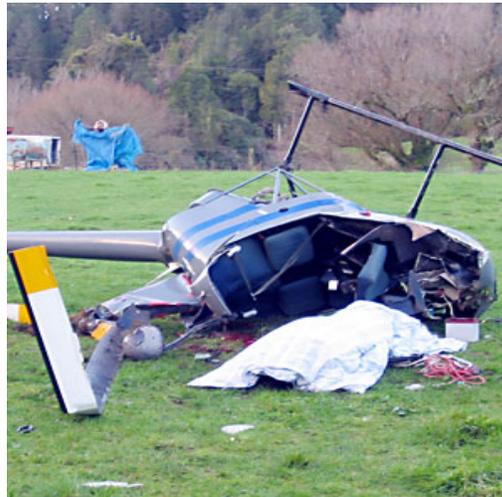
## Engineer told CAA of safety concerns

**A licensed aircraft engineer was so scared that a mistake in maintenance by Nelson company Skytech Aviation might lead to a helicopter crashing that he told the Civil Aviation Authority of his concerns - a month before a fatal crash.**

At the end of a depositions hearing in the Nelson District Court on Wednesday, lawyers for two **Nelson men charged with the manslaughter** of Murchison helicopter pilot Phillip Devon Heney argued that they should be discharged because of a lack of sufficient evidence of criminal offending.

But Justices of the Peace Harry Baigent and Anne Batten committed John Arthur Horrell, 56, and Ronald David Potts, 59, to stand trial in the High Court at Nelson.

Horrell, the owner and managing director of Skytech Aviation (2003) Ltd, and **Potts, a licensed aircraft maintenance engineer**, each pleaded not guilty and were remanded on bail to May 28.



**The charges allege a lack of supervision when critical control system components were installed** in Mr. Heney's Robinson R22 helicopter at Skytech.



Former Skytech licensed aircraft engineer Dean Beale told the court yesterday that when he left the company in February 2005 to take up a job in Central Otago, Skytech had no full-time licensed engineer to replace him.

Mr. Beale told how, as a certifying engineer, he sometimes clashed with Harrell, an unlicensed engineer.

"He would interfere after I had told an engineer to do a job a particular way," Mr. Beale said.

"He would generally wait until I walked away and then he would come and see what they were doing and suggest a different approach to the job."

Mr. Beale said that sometimes Horrell was right with his suggestions, but as the licensed engineer making decisions, he wanted workers to do as he instructed so he felt comfortable about the job being done, and he would have the final say.

The stress of the job, and Horrell's interference, prompted him to leave Skytech.

Mr. Beale said that in telephone calls after he had left, Skytech apprentice Ross Burdon told him about a lack of supervision at the company, of installing parts that were faulty, and of some practices that were not to standard or regulation. Mr. Burdon told him he was concerned about the maintenance of two aircraft in particular - the R22 that Mr. Heney flew and a Hughes 300 helicopter.

Concerned that Mr. Burdon was carrying out important maintenance unsupervised, Mr. Beale e-mailed Civil Aviation Authority safety adviser Bob Jelley on July 22, 2005, setting out his concerns about practices at Skytech.

"I was scared there was going to be an accident," he said.

"Either one of the machines would be involved through a mistake being made in the maintenance.

"I hoped that if he paid John (Horrell) a visit he might help John get on the right track with supervision."

The court heard that Mr. Jelley visited Skytech on August 1, 2005.

Mr. Beale told Horrell's lawyer, Philip Morgan QC, that after raising his concerns with Horrell, he e-mailed Mr. Jelley again on July 26 to tell him Harrell was trying to deal with the problem.

Mr. Beale said he was "devastated" when he learned that Mr. Heney had died in the helicopter crash on the Heney farm near Murchison on August 26, 2005.

Mr. Burdon told the court this week that Potts, who worked part-time for Skytech, was the certifying engineer for the R22 work. He said Potts was not present during the final assembly of the tail section but checked the work through a small inspection hole in the tail boom.

"For me personally," said Mr. Beale, "I couldn't sleep at night by just looking through a small aperture at it.

"I'd like to see the whole assembly because I can't feel confident enough doing a duplicate inspection just via that window," he told Potts' lawyer, Philip Hall.

Yesterday's revelation that the CAA was warned about work practices at Skytech comes four months after an international consultants' report said the authority was light on policy and regulatory expertise and lacked agreement over how to target high-risk operators.

An Auditor-General's Office report also criticized the CAA's failure to ensure that small aircraft were safe.

Acting Transport Minister Harry Duynhoven and CAA spokesman Bill Sommer would not comment on the case as it is before the courts.

## Small aircraft crash probes need work

VANCOUVER -- Accident investigations involving smaller aircraft often fail to address the big-picture causes such as an airline's failure to enforce a culture of safety that might have contributed to the crash, an aviation expert said at an international safety conference.

"We're quick to point the finger at the pilot, to say what the person did wrong," Scott Shappell, a professor of industrial engineering at Clemson University in South Carolina, said in an interview.

"But we don't look deep enough to find out why, and that doesn't get to the underlying problem."

Shappell said that when a major passenger jet crashes, causing extensive loss of life, federal investigators will "turn over every rock" to find the cause, including looking at factors such as management safety practices.

That same thoroughness does not always apply to the crash of smaller aircraft, simply because accident investigation agencies may lack the time or manpower, he said.



"Historically, we haven't done a very good job of looking at the organization and the supervisory roles," said Shappell, who co-invented the Human Factors Analysis and Classification System to make it easier for investigators to trace the wider ranges of accident causes.

Transport Canada one year ago promised a review of B.C.'s air-taxi industry after the deaths of 14 people in six accidents over about 13 months.

But the federal government has yet to release the results of that review. Merlin Preuss, director-general of civil aviation, could not be reached in Ottawa yesterday.

Shappell spoke at a safety conference sponsored by CHC Helicopter Corporation of Richmond, the world's largest helicopter company, with extensive oil rig service operations internationally. A total of 140 helicopter and air-safety officials from 27 countries are attended the conference.

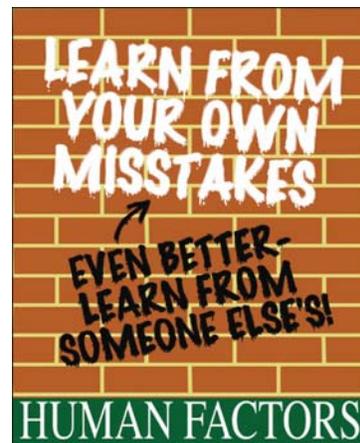
CHC vice-president Greg Wyght said **the worldwide rate of helicopter crashes is about 12 per 100,000 hours, at least twice the North American rate. The industry goal is an 80-per-cent reduction in crashes in 10 years.**

Bill Yearwood, regional manager for the Transportation Safety Board, noted from his Richmond office that helicopters are more vulnerable to crashing because of the rough terrain in which they fly and land, and the increased number of takeoffs and landings (including picking up and dropping off logs), compared with passenger jets cruising at high altitude for hours.

## What's Next: Mistakes Were Made

**When your company screws up, don't hide it. Blog about it. And let everyone learn from the error.**

I'm a licensed pilot, and I once managed to land a small plane on the wrong strip at a small airport. I could have gotten in pretty big trouble for it, so you might have thought my best move would have been to keep my mouth shut and hope the FAA wouldn't find out. But I couldn't wait to report my screw-up to the government. I wish I could say it was because I'm such a conscientious fellow. But the truth is, I fessed up fast because the U.S. government rewards pilots for quickly owning up to their mistakes, agreeing to waive punitive action if they report themselves. In fact, most pilots carry the self-reporting form with them in their flight kit, just in case.





Why the free ride for confessors? Because the government wants pilots to learn from one another's mistakes in an effort to keep accident rates low. Indeed, the flood of self-reports--nearly 3,000 a month on average, including confessions from air traffic controllers, aircraft mechanics, and flight attendants--are gathered by NASA and selectively published in a monthly newsletter, "Callback," that's a must-read for 150,000 pilots and other aviation personnel each month. In one issue, for example, a commercial airline pilot admitted that he failed to position the flaps at the back of the wings correctly at takeoff, nearly causing the plane to plunge. The pilot of a business jet described how he didn't hit the right buttons for the cabin pressurization system, which could have left crew and passengers starved for oxygen at 22,000 feet. Neither pilot was fined or punished.

You can't stamp out mistakes at your company, no matter how good a manager you are or how brilliantly you hone your processes. Essentially, you can do one of two things: create an environment in which mistakes are seen as shameful and counterproductive; or create one in which each mistake becomes a collective learning experience. To me, the choice seems obvious. Do employees at your company point out their own screw-up--even the ones that might not otherwise have been discovered by management?

Probably not! But let me suggest an easy way to fix the situation: Blog it.

We've heard a lot about blogs over the past few years, and it's clear that corporate America is in on them. Many corporate blogs are sanitized, public-relations-oriented affairs intended to create bonds with existing and potential customers. Others serve as internal message boards to keep employees up to date. But I'm proposing something else: a blog that encourages employees and managers to tell their peers what they themselves have done wrong. It's an easy step that could quickly effect a large, positive change in your corporate culture.

Such blogs are rare. But they do exist. The Mayo Clinic in Rochester, Minnesota, for example, has set up a system in which medical residents electronically log their mistakes or any other problems they see so the hospital can analyze the errors and look for fixes. It's more of a database than a blog, but any resident can post to it without fear of recrimination. (The residents identify themselves on their reports, but are only publicly named if they're getting credit for coming up with a solution to a problem.) "The residents are in the trenches seeing what's going on, and they pick up on things we may not be aware of," says Furman McDonald, a faculty member in internal medicine. "We're trying to get across that people can present their mistakes in a forum that won't leave them feeling chastised."

Because residents are promised that what they confess to the Mayo stays at the Mayo, the clinic wouldn't share an example of a confessed mistake. (We may be better off not knowing.) But feedback from residents has led to some significant changes at the clinic. It's improved the gathering of information about different drugs prescribed by different doctors to the same patient to avoid problematic drug interactions.

It has also enabled doctors to do a better job of picking up on obesity-related complications and created a safer way to deliver some medicines to diabetic patients.

The U.S. Department of Energy, meanwhile, is pushing its contractors to gather and share goof-ups via so-called "lessons learned" databases accessible to employees at all of its contractors. Fluor Hanford, an engineering firm that is tackling one of the world's toughest environmental cleanup sites in Hanford, Washington, has been particularly enthusiastic about getting its employees to fess up. Tony Umek, Fluor Hanford's vice president for safety and health, says that the database led to the discovery that a number of employees were going around standard company purchase procedures to buy their own electrical equipment--and that some of the equipment was flawed. Everyone involved was thanked for their honesty. "The best people make mistakes, and that's a fact of life," says Umek. "We want our people to see the mistakes coming and report them, so we don't have to lament a debilitating injury after the fact."

Of course, the culture of hiding error to avoid blame and punishment is ingrained in most of us from an early age and perpetuated in companies because managers tend to whack employees who mess up. Managers themselves don't go around blabbing about their own errors because they want to be seen as role models for the highly effective. Some organizations, including the U.S. Marines and aerospace maverick Burt Rutan's Scaled Composites, have created cultures that celebrate honest mistakes and confession, but they are exceptions and are not easily replicated.

Deep down, people want to confess their mistakes. And that's truer than ever in the Internet age.

And this is where the specific appeal of piggybacking on new blogging technology comes in. It's fine to include an error-confession session in meetings, on databases, and on suggestion slips. But blogs are tailor-made for sharing screw-up because they're conversational, intimate, low key, and usually easy to read or post to. It's also a perfect format for small companies. A blog with, say, three or four posts a day is a lot easier to maintain than one with 60 posts a day. Blogs are cheap--many blogging tools are free--and can be set up in a few hours.

A confessional blog can provide real benefits in a matter of weeks, if not days. As great as we are at learning from our own mistakes, you can learn almost as much from the mistakes of others. Don't take my word for it. Research recently published in *Nature Neuroscience* by a team of Dutch scientists indicates that "similar neural mechanisms are involved in monitoring one's own actions and the actions of others." In other words, watching your colleague blow a sale has much the same effect on your brain as hearing yourself do it.

The hardest part, of course, will be sticking to your promise to not bring down the hammer on those who confess to good-faith mistakes.

That's not to say you need to let *everything* slide. Make it clear that confessions of malfeasance, real damage, and repeated offenses don't merit get-out-of-jail-free cards. (The FAA gives pilots one freebie every five years, and there's no amnesty if a crime is committed or something gets smashed up.) Not everyone will be happy about where you draw the line, but it's easy enough to draw it and to make clear that anyone who doesn't cross it will truly be appreciated for sharing.

By the way, my flying mistake apparently wasn't deemed instructive enough to make the newsletter. However, a warning was added a bit later to the aviation map for that airport to alert pilots to the very mistake I had made. I like to think of it as my contribution to aviation.

## Safety issues of China's air surge

China's surging air travel market is giving authorities a safety headache as passenger numbers grow to a predicted 270 million by 2010, a senior aviation official said, quoted in yesterday's China Daily. The ramifications for air traffic both to and from the UAE are relevant with the popularity of Emirates Airline's new route to Beijing and also the expansion of budget carriers. Air Arabia currently flies the flag for low-cost air travel from the UAE, but it is rumored that it will soon be joined in the region by UK-based carrier easyJet. Air Arabia's eyes are certainly fixed on potential markets east of the sub-continent and it is clear that Air China is looking in the opposite direction.



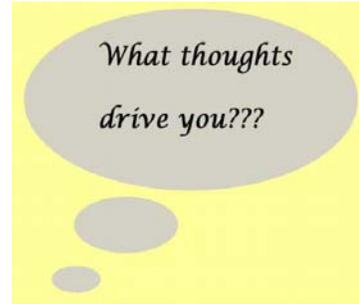
Wang Changshun, the deputy director of the General Administration of Civil Aviation of China (CAAC), said Beijing aimed for an accident rate of below 0.3 per million flight hours, a comparable rate to that in developed countries.

"With the rapid increase of the air transport volume and fast-expanding airplane fleets, we are facing more and more pressure and difficulty to ensure flight safety," he said.

He added that China had to overcome problems such as the lack of competent human resources, poor facilities and congested airspace. The CAAC in May announced the creation of an air safety institute to train 10,000 staff over the next five years. Wang estimated that China would need 11,000 more pilots by 2010 and 18,000 by 2015.

## Watch your Thoughts

Watch your Thoughts, they become words.  
Watch your Words, they become actions.  
Watch your Actions, they become habits.  
Watch your Habits, they become character.  
Watch your Character, for it becomes your Destiny.



## STRESS AT THE WORKPLACE

### The 10 Most & Least Stressful Jobs

Top 10 Most Stressful Jobs
1. Inner city high school teacher
2. Police officer
3. Miner
4. Air traffic controller
5. Medical intern
6. Stockbroker
7. Journalist
8. Customer service complaint worker
9. Secretary
10. Waiter



**Air traffic controller:  
Number 4 on the stress list**

**Top 10 Least Stressful Jobs**

**1. Forester**

**2. Bookbinder**

**3. Telephone line worker**

**4. Toolmaker**

**5. Millwright**

**6. Repairperson**

**7. Civil engineer**

**8. Therapist**

**9. Natural scientist**

**10. Sales representative**

Source: *Health Magazine*

**Picture This!**



## 10 strategies to improve memory

Normal age-related changes in the brain can slow some cognitive processes, making it a bit harder to learn new things quickly or to ward off distractions. The good news is that, thanks to decades of research, most of us can sharpen our minds with proven, do-it-yourself strategies. Here are some ways to boost your ability to remember as you age.

### 1. Believe in yourself.

Myths about aging can contribute to a failing memory. Middle-aged and older learners do worse on memory tasks when exposed to negative stereotypes about aging and memory, and better if exposed to messages about memory preservation into old age.

### 2. Economize your brain use.

Take advantage of calendars and planners, maps, shopping lists, file folders, and address books to keep routine information accessible. Designate a place at home for your glasses, keys, and other items you use frequently.

### 3. Organize your thoughts.

New information that's broken into smaller chunks, such as the hyphenated sections of a phone number or social security number, is easier to remember than a single long list, such as financial account numbers or the name of everyone in a classroom.

### Improve your memory with a good night's sleep

Sleep is essential for memory consolidation as well as overall health. Research suggests that six to eight hours of sleep a night is ideal for most people. Perhaps even more important than the amount of sleep is the quality of sleep. For better sleep *and* memory, try the following:

- **Establish and maintain a consistent sleep schedule and routine.** Go to bed at the same time each night and wake up at the same time each morning.
- **Plan to do your most vigorous exercise early in the day.** Exercising in the hours immediately before bedtime causes physiological changes that interfere with sleep.
- **Avoid coffee and other sources of caffeine** (e.g., chocolate, many soft drinks, some brands of aspirin, many types of tea) after midmorning, because caffeine is a stimulant that can keep you awake for hours afterward.
- **Avoid napping during the daytime.** Napping can disrupt your natural sleep cycle and prevent you from feeling tired enough to fall asleep at night.
- **Don't take sleeping pills unless nothing else works.** If you do take a prescription sleep medicine, work with your doctor to use it effectively but only on a short-term basis.
- **Don't try to sleep if you're not tired;** otherwise you'll set yourself up for tossing and turning. If you're still awake after about 20 minutes in bed, get up and read awhile to relax.

#### **4. Use all your senses.**

The more senses you use when you learn something, the more of your brain will be involved in retaining the memory.

For example, odors are famous for conjuring memories from the distant past, especially those with strong emotional content, such as the scent of your grandmother's freshly baked cookies.

#### **5. Expand your brain.**

Widen the brain regions involved in learning by reading aloud, drawing a picture, or writing down the information you want to learn (even if you never look back at your notes). Just forming a visual image of something makes it easier to remember and understand; it forces you to make the information more precise.

#### **6. Repeat after me.**

When you want to remember something you have just heard or thought about, repeat it out loud. For example, if you've just been told someone's name, use it when you speak with him or her: "So, John, where did you meet Camille?"

#### **7. Space it out.**

Instead of repeating something many times in a short period, as if you were cramming for an exam, re-study the essentials after increasingly longer periods of time — once an hour, then every few hours, then every day. Spacing out periods of study is particularly valuable when you are trying to master complicated information.

#### **8. Make a mnemonic.**

Mnemonic devices are creative ways to remember lists. They can take the form of acronyms — such as the classic "Every good boy does fine," to remember the musical notes E, G, B, D, and F on the lines of the treble clef. For older learners, a particularly helpful system is a story mnemonic — that is, a brief narrative in which each item cues you to remember the next one.

#### **9. Challenge yourself.**

Engaging in activities that require you to concentrate and tax your memory will help you maintain skills as you age. Discuss books, do crossword puzzles, try new recipes, travel, and undertake projects or hobbies that require skills you aren't familiar or comfortable with.



## **10. Take a course.**

Memory-improvement courses are becoming more popular. If you decide to try one, choose a program run by health professionals or experts in psychology or cognitive rehabilitation. Stay away from courses that center on computer or concentration games, which generally won't help you with real-life memory problems. Select a course that focuses on practical ways to manage everyday challenges.

**END**