

# 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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★Auto-pilot good for planes, not people

★Sully Sullenberger talks about patient safety

★Sleep Apnea and Airline Safety

★Beyond the Black Box — book review regarding airplane crashes

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★Six simple ways to smarter, healthier eating

★Study Explains Why the Circadian Rhythm Affects Health

## FAA Seeks GA Survey Input

The FAA Safety Team is asking aircraft owners and operators in the general aviation community to participate in an online survey about how they use their aircraft. The annual survey is the only source of information on the activities of the GA fleet, including number of hours flown and the reasons people fly, to the FAASTeam website. FAA Acting Administrator Michael Huerta encouraged aircraft users to respond. "By taking the time to participate in the FAA's GA survey, owners and operators share valuable data that help the entire GA community," he said. [The survey is available online.](#) Data collected from the survey help determine funding for infrastructure and service needs, assess the impact of regulatory changes, and measure aviation safety, according to the FAASTeam. The survey is also used to prepare safety statistics and calculate the rate of accidents among GA aircraft. Responses are private, the FAA says, and the information will be used only for statistical purposes. Owners who did not fly their aircraft in 2011, have sold it, or are awaiting repairs should also respond to the survey. The survey closes on Nov. 30.



<http://www.faasafety.gov/SPANs/noticeView.aspx?nid=4110>

## Auto-pilot good for planes, not people

The term "bored to death" might not be as much of an exaggeration as it sounds.

Dr. Martyn Dyer-Smith, a psychologist at Northumbria University in Carlisle, England, and another researcher, Dave Wesson, have found that [mind-numbing repetitive task](#), even complicated ones, put most people into "auto-pilot" mode.

“Actually, it is more like auto-pilot takes control and ignores the pilot,” said Dyer-Smith. In an emergency, he said, most people in an auto-pilot state would have difficulty reacting soon enough to prevent a serious incident.



“We are continuously adjusting our output, physically and mentally, to the demands of the current situation,” he said “If the situation changes, [so should we](#), but we cannot change instantly.

If we stop paddling a canoe it runs on for a period. But some folks’ minds are the equivalent of a supertanker. They run on and on.”

Dyer-Smith and Wesson’s research involved having participants work on boring, repetitive puzzles and then suddenly introducing tasks that demanded quick action. Some participants were 40 times more “mentally agile” than others, meaning they could adapt quickly. Others could not.

Some jobs are so boring that it becomes [virtually impossible](#) to perform them correctly over long period. Dyer-Smith said workers at a British nuclear power plant were required to physically measure plutonium pellets that had already been checked by a machine.

One worker would measure a pellet and yell out its size to another worker, who entered the number-invariably the same number, time after time. After a while the workers stopped taking measurements and simply entered the “right number” because the job was too boring to endure.

Dyer-Smith says [without stimulation, the mind naturally winds down until the person falls asleep](#).

“Experts make the worse error. When a sufficient level of expertise is achieved in any task, the problem of consistent high-level performance becomes the key issue. [The expert can become vulnerable to error](#) in a quite distinct way from the novice,” he said.

What to do to [reduce](#) the changes of boredom leading to a workplace injury:

- > If the work can be changed to make it less boring, do so.
- > Assigning workers to teams and rotating them through task.

> If workers have some control over the pace of work they tend not to become as bored as they do if the pace never varies.

Dyer-Smith said disciplining a bored worker who is involved in an incident **will not** achieve anything positive.

## **Sully Sullenberger talks about patient safety**

Who could forget the live pictures on CNN? A US Airways passenger plane floating majestically on the Hudson. It looked like some giant bird, wings spread, just effortlessly ambling along. But it was far from that. Nearly four minutes after take-off as the aircraft climbed to 3,000 feet, Captain Chesley “Sully” had radioed the LaGuardia tower announcing that he had hit a flock of birds, “lost thrust on both engines” and was heading back to the airport. We all know what happened next.



Sullenberger, unable to make it back to the field, ditched the Airbus 320 into the Hudson. Miraculously, all 150 passengers aboard survived. Sullenberger and his crew became national heroes that day. Amid the doom and gloom of the near collapse of the nation’s economy, America found something to celebrate – a team of professionals who had executed their crisis skills with precision and unparalleled expertise.

Since retiring from aviation, Sullenberger has been accorded a hero’s mantle. He has written two books, one a best-seller, and is a highly sought after motivational speaker. He continues to push for aviation safety and has taken on another role, as a **patient safety advocate in health care**.

So how did the patient safety advocacy come about? He talks about that in a recent 1:2:1 conversation and tells us that if the **daily errors in medicine occurred in aviation**, the skies would be empty.

Audio

<http://scopeblog.stanford.edu/2012/08/23/sully-sullenberger-talks-about-patient-safety/>

## Sleep Apnea and Airline Safety

Sleep apnea, which is a sleep disorder characterized by abnormal pauses in breathing (and often accompanied by loud snoring) is an ongoing health issue that affects people all over the world, and **can lead to higher risks of** hypertension, heart attack, stroke, and diabetes. While there are a number of treatments available for this problem, whether it gets properly treated depends on whether someone suffering from sleep apnea is made aware of the potential problem, and encourage to seek medical help.

### **What does this have to do with the airlines?**

If you have ever been a passenger who was awakened in the middle of a red eye flight by someone three rows back snoring like an unmuffled chainsaw, you've probably been affected by sleep apnea. While sleep apnea in the passenger cabin may be an inconvenience, a flight or cabin crew member suffering from sleep apnea **may have that condition affect the quality of their work**, and the safety of everyone on board.

### **Recent article on sleep apnea**

[A recent article by two Harvard School of Public Health professors discussed whether some groups are more at risk for sleep apnea.](#) Some of those risk factors include poor air quality, a factor that many air crew may be exposed to in the workplace.

### **Full disclosure**

While sleep apnea has been a long term concern of the FAA, interest in the subject today is sparked by one of the two authors of [the Huffington Post article](#) on sleep apnea. [Dr. Michelle A. Williams](#) is not only the Chair of the Department of Epidemiology at the Harvard School of Public Health.



### Resources

[FAA brochure on sleep apnea](#)

<http://healthysleep.med.harvard.edu/sleep-apnea>

[http://www.huffingtonpost.com/susan-redline-md-mph/sleep-apnea-poverty\\_b\\_1837805.html?utm\\_hp\\_ref=sleep](http://www.huffingtonpost.com/susan-redline-md-mph/sleep-apnea-poverty_b_1837805.html?utm_hp_ref=sleep)

## **Beyond the Black Box — book review regarding airplane crashes**

*Beyond the Black Box: the forensics of airplane crashes* — book review regarding airplane crashes

For many, the study of aircraft crash events may be morbid. But, the number of crashes has **allowed much knowledge to be gained** so an analyst can gain understanding through statistics and the variety of professionals performing their specialty investigations. To be sure, the author (an expert in the field) discusses the myriad of things which are investigated: structure, fire, engines, seats, wiring, lightning and more. Famous and not so famous incidents and accidents are used to illustrate the points that are illuminated. **Picking a few items, I learned:**

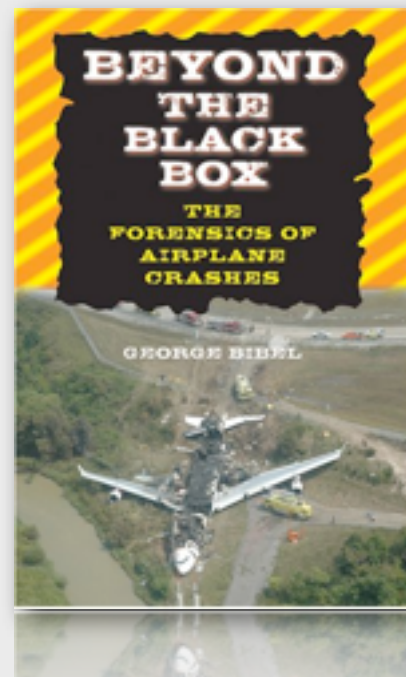
Knute Rockne's death in a crash of a Fokker F-10A led to accident as we know it today

The Luftwaffe, beginning in 1939, began ejection seat development and thoroughly studied each spinal vertebrae for G-force resistance (a table is provided). This data is used today in the design of passenger seats.

When a jet engine has a contained failure or an uncontained failure it is termed as an engine burst

How 7000 pounds (3500kg) of titanium ingot is used to make a 6200 pound (~2820kg) billet that is subsequently cut into 700 pound (~320kg) forging blanks to make fan disks. Why fan disks are forged and not cast as well as why the hard alphas must be detected (a type of crystal defect which increases the likelihood of disk failure).

Titanium ignites at half its melting point, which is a curiosity, and why a jet engine often has a short intense fire when a fan blade or disk fails.



The titanium contacts the surrounding metal and ignites, titanium scrub, burning intensely but usually quickly extinguishes.

Everything in an airplane's construction has a paper trail, and some trails over a decade and a half old have been tracked in aircraft crashes

The physics of hit-and-stick accidents as opposed to hit-and-slide accidents

This is an excellent book, not only full of information (tables, math formulae and sketches) but replete with knowledge. Reading this book will give a comprehensive understanding of airplane design as well crash investigation procedures.

## **September is National Alcohol and Drug Addiction Recovery Month**

Recovery month, which has been observed for 23 years, originally focused on recognition for professionals who treat patients for substance abuse. In 1998 it shifted to celebrating the successes of individuals who had overcome addictions, and in 2011 it expanded to encompass all forms of behavioral health. The core message of this initiative is

multifold. **Prevention works**; treatment is effective; people can and do recover to live healthy and rewarding lives; behavioral health is essential to overall health.

### **U.S. Substance abuse statistics**

17.6 million people-about one in every 12 adults-abuse alcohol or are alcohol dependent; alcohol is the leading risk factor in deaths of males 15 to 59; alcohol dependence and abuse costs \$220 billion a year; more than 40 people per day die from drunk driving, approximately 16,000 people per year; more than 10 million people abuse prescription medications; more than 3 million people use cocaine; and nearly half of all drug related emergency room visits are due to cocaine abuse.



For more information to [www.recoverymonth.gov](http://www.recoverymonth.gov)

## Six simple ways to smarter, healthier eating

To eat well, **you need** to combine nutritional science, a jolt of common sense, and pure enjoyment. Most of us know that fresh salad, berries, and slowing down when eating are better for us than wolfing down energy bars and sweets. But how to make that leap from our current habits to healthier ones? Here are six ways you can eat healthy, delicious meals, and really enjoy what you're eating. 1) Ditch whole milk

Not only does this reduce saturated fat in your diet, it shaves off calories.

How: Switch to 1% or nonfat milk, and nonfat versions of other dairy products like yogurt and ice cream. Can't bear to go cold turkey? Step down more slowly to 2% milk, then 1% en route to nonfat, if possible.

### 2) Harness the power of nuts (and seeds)

Almonds, cashews, filberts, hazelnuts, peanuts, pecans, and pistachios pack plenty of beneficial nutrients, including vitamin E, folic acid, potassium, and fiber. Although many nuts are high in fat, the fat is mainly unsaturated – a healthy choice.

How: First, put nuts on the grocery list. Nuts are high in calories, so it's best to enjoy them in place of other snacks, not in addition, and to keep serving sizes small.

### 3) Taste food before you salt it

Break the **autopilot habit** of reaching for the salt shaker.

How: For two days, don't put any salt on your food at all. A short break can help reset your taste buds. Then, leave the salt shaker in the cabinet, so it becomes a bit of an effort to reach for it. Make a ritual out of truly tasting your food before you decide if it needs tweaking.





#### 4) Pack lunch once a week

This makes healthy food choices readily available to you at work or on an outing. And since you are controlling portion sizes, you can make sure that you're not super-sizing your meal. Plus, it saves you money.

How: Once a week before you shop for groceries, write out a meal plan that leaves enough leftovers for one or two lunches.

#### 5) Eat five (or more) vegetables and fruits a day

It's a nutrient-packed way to fill your plate that is generally low in calories.

How: First, for one week, keep track of how often you eat fruits and vegetables. One serving equals one-half cup of chopped fruit or most vegetables; for raw leafy vegetables like lettuce and spinach, a serving is one cup. Once you have your baseline, try adding one fruit or vegetable serving a day.

#### 6) Plan meals that are delightful, delicious and healthy

In an ideal world, food delights all our senses: it looks beautiful, smells heavenly, and tastes delicious, and its textures feel and even sound satisfying. Start thinking about food as something to really savor and enjoy.

How: Pencil in time to prepare and savor one or two special meals a week. Once you've assembled great ingredients, set a gorgeous table. Take a moment to truly take in scents, companions, and surroundings, and if you like, give thanks.

For 42 simple changes to help you exercise more, eat healthier, stress less, and live a happier, more fulfilling life, [purchase Simple Changes, Big Rewards from Harvard Medical School](#).

## Study Explains Why the Circadian Rhythm Affects Health

Disruptions to the circadian rhythm can affect the growth of blood vessels in the body, thus causing illnesses such as diabetes, obesity, and cancer, according to a new study from Linköping University and Karolinska Institute in Sweden. In an article published in the scientific journal *Cell Reports*, it is demonstrated for the first time that disruption of the circadian rhythm immediately inhibits blood vessel growth in zebra fish embryos. Professor Yihai Cao leads a research group that has demonstrated that the breaking point is the production of a very important signaling substance: vascular endothelial growth factor (VEGF). The formation of this substance requires a normal circadian rhythm.



During experiments with hours-old zebra fish embryos, the researchers manipulated their circadian rhythm through exposing them to lighting conditions varying from constant darkness to constant light. The growth of blood vessels in the various groups was then studied. The results showed that exposure to constant light (1,800 lux) markedly impaired blood vessel growth; additionally, it affected the expression of genes that regulate the circadian clock.

"The results can definitely be translated into clinical circumstances. Individuals with disrupted circadian rhythms—for example, shift workers who work under artificial lights at night, people with sleeping disorders or a genetic predisposition—should be on guard against illnesses associated with disrupted blood vessel growth," says Lasse Dahl Jensen, researcher in cardiovascular physiology at Linköping University and lead writer of the article.

Such diseases include heart attack, stroke, chronic inflammation, and cancer. Disruptions in blood vessel growth can also affect fetal development, women's reproductive cycles, and the healing of wounds.

<http://www.cell.com/cell-reports/abstract/S2211-1247%2812%2900201-X>