

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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USAF to rebuild its aerospace physiology expertise

The US Air Force's Scientific Advisory Board (SAB) investigating the Lockheed Martin F-22 Raptor's life support system found that the service has allowed its aerospace physiology expertise to deteriorate. As part of a solution to the Raptor's woes, the USAF will have to rebuild those capabilities. "We reduced the emphasis and the numbers of people associated with [aviation physiology research and science](#)," says retired Gen. Greg Martin, who led the SAB study. During the 1990s Cold War drawdown, the USAF shrank from around 600,000 personnel to a current level of around 330,000, Martin says. Among the casualties of the drawdown were aviation physiologists even as the service worked to develop the Raptor, which operates at far high altitudes than existing fighters.



"The Centre of Excellence for Aviation Physiology, Human Systems Integration and those sorts of things need to be re-established because we are operating an aircraft in an environment with systems that perform differently than before, and [they may have some effect on the humans' response and in the human reaction](#)," Martin says. "We're not aware of some of those yet. And we did not have the research to do it."

Kevin Divers, CEO of Warrior Edge, an aircrew flight equipment distributor and physiology/[human factors](#) consulting firm, says that the current training for USAF aerospace physiology is inadequate. The career field, though manned by good people, needs a better connection to the science they study and to its application in the operational flying arena. "They need to have a better bond with the aircrew they are to work with," the former F-22 flight test engineer says. "This could be done by putting the trainees through the first phase of pilot training before they complete their formal air force training in aerospace physiology"

It would help to have about 10 flights in a Hawker-Beechcraft T-6 trainer, Divers says. That would be similar to what the US Navy does for its physiologists, but even cockpit simulator time at their operational bases would be useful. That is especially true for bases with single-seat aircraft only.

At one time, the USAF used to have its physiologists fly in a general aviation aircraft during their initial training to familiarize themselves with the cockpit, but that program was discontinued due to funding.

But even that program was not "particularly dynamic nor a way to instill an air force aircrew mindset" Divers says.

But at a more basic level, physiologists need to be trained on the actual hardware pilots use, "even if it is through a simulator with actual aircrew training them," he adds.

"If they could be taught more on the science of the equipment," he says, it would help. Currently, physiologists are not instructed to the same standards as the aircrew flight equipment personnel on the actual apparatus pilots use in the air, instead they are taught on PowerPoint slides detailing the very basics of the hardware. "They wear the equipment during their centrifuge training, but not to a standard that would qualify them as an expert or instructor on the equipment," Divers says.

Nor are there any practical recurring training or qualification checks on particular pieces of equipment like a G-suit. "I really think if they put an [aircrew style mentality](#) to our training, it would help us, both in our ability to help our aircrew and develop the street credibility that I think we currently lack" he says.

"Individual physiologists stand out as very credible sources, but the career field progression does not require this or challenge us to become subject matter experts."

It would also be beneficial if base physiologists had access to a hotline of selected experienced flight surgeons, pilot physicians, or research physiologists, he says.

Another possible measure might be to have a wing pilot trained as a physiologist as a secondary duty-similar to how units have a standards and evaluation officer or safety officer. Such an officer would be better able to interface with pilots and provide the physiology communities a better understanding [what an aircraft does to aircrew physiologically](#).

"There used to be rated-physiologists, that went away," Divers says. "I think if they brought back the rated-physiologists [that would help]. Maybe they might not be able to handle per-squadron, but they may be able to handle per wing."

New Aviation Safety Website Designed To Help Companies With Safety Programs

Global Aerospace Launches Site With Multiple Partners

A new website dedicated to providing [safety resources to the aviation community](#) has been launched by Global Aerospace Inc. Developed through the company's SM4 safety program the new website is an indispensable resource for aviation professionals who [are serious about improving and promoting safety](#) within their organizations. Program director Richard Keltner says "The articles and tools found on the new website can have an immediate, positive effect on a company's safety program. The entire site is dedicated to the improvement of [Safety Management Systems \(SMS\) and safety culture](#), regardless of a company's size or specialization within aviation". The SM4 website includes an expanded resource library with powerful search tools, allowing user to access numerous articles and tools on the site covering a wide range of safety issue for no charge. The site's search engine allows location of resources by keyword, topic or author. All articles and tools in the Resource section can be converted to PDF files that can be printed or distributed by email. This allows users to share content with people within their organizations as part of their safety promotion efforts.



The new SM4 site is also home to an [aviation safety blog](#) with insights and information provided by SM4's partners and leadership team. The blog's goal is to create cutting edge conversations about the most important topics in aviation safety and risk management.

SM4's new website provides information about the SM4 Partners. These organizations and individuals are highly regarded experts who collaborate with Global Aerospace to provide current, high quality aviation safety support tools and information. Each partner provides a unique focus on each of the components that add up to a comprehensive safety system. The SM4 Partners are Baldwin Aviation, Convergent Performance, Fireside Partners LLC, ICF SH&E and MedAire Inc.

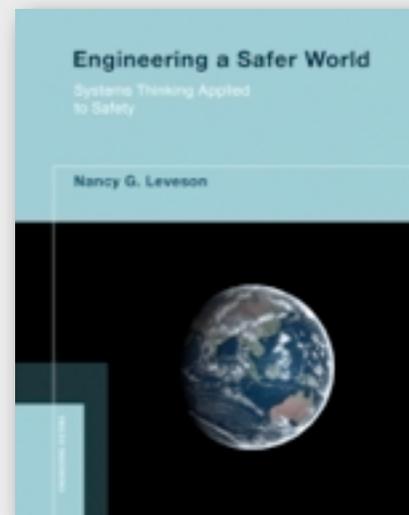
The new SM4 website also contains information on upcoming SM4 Safety Seminars sponsored by Global Aerospace, current and past issues of the SM4 [Safety Newsletter and links](#) to other safety-related websites.

FMI: <http://SM4.global-aero.com>

Engineering a safer world

Innovations in software and technology are creating increasingly complex systems: cars that park themselves; medical devices that automatically deliver drugs; and smartphones with the computing power of desktop computers, to name a few. Such complex systems allow us to do things that seemed difficult or impossible just a few years ago. But Nancy Leveson, professor of aeronautics and astronautics and engineering systems at MIT, says [increasing complexity is also making systems more vulnerable to accidents](#). What's more, she says traditional safety engineering approaches are not very effective in keeping new and fast-evolving systems safe. For example, engineers typically evaluate the safety of a system by checking the performance of each of its components. Leveson argues that safety — particularly in complex systems — depends on more than a system's individual parts. For the past decade, Leveson has been championing a new, more holistic approach to safety engineering. In addition to analyzing systems' technical components, her approach — dubbed STAMP, for System-Theoretic Accident Model and Processes — [addresses the impacts of human, social, economic and governmental factors on safety](#).

Last week, Leveson hosted a three-day workshop at which more than 250 safety engineering professionals from around the world gathered to learn about STAMP and to explore the event's theme, "Engineering a Safer World." The event also coincided with the publication of Leveson's new book on the topic, titled [Engineering a Safer World: Systems Thinking Applied to Safety](#).



The workshop drew participants from industries including aviation and automotive engineering, occupational health, missile defense, road tunnel safety, and medicine, some of whom gave presentations during the workshop.

In many cases, [safety analyses are performed only after an accident](#) has occurred. Several researchers at the workshop presented cases in which they used Leveson's approach to identify causes of accidents.

Daijiang Suo, a graduate student in computer science at Tsinghua University, reconstructed a 2003 train accident that killed 40 people in southwest China. Engineers originally determined that lightning caused a track circuit to malfunction, causing the train to derail. Using Leveson's approach, however, Suo expanded the parameters of safety [to include other factors](#), ultimately attributing the accident in part to communication issues between operators and in part to pressure to keep the train on schedule.

<http://mitpress.mit.edu/catalog/item/default.asp?type=2&tid=12662>

FAASafety.gov



Bell Helicopter
Notice Number: NOTC3701

The Bell Helicopter, Textron Inc. safety publication, Helicopter Professional Pilots Safety Program or HELIPROPS, designed for helicopter pilots, [is now available electronically online](#). Bell's newsletter [Human AD, Airworthiness for Humans](#), is published in English and Spanish and is distributed to readers in approximately 122 countries. A popular feature of the newsletter are articles from helicopter pilots' own experiences flying in "unusual situations;" all for the purpose of exchanging safety information, best practices, etc., pilot to pilot.

The web site, <http://www.heliprops.com>, is a free resource for pilots, mechanics, owners/operators, students and enthusiasts. From the web site, readers are able to download the Human AD newsletter, HELIPROPS Safety Posters and the "History of Helicopter Safety," authored by Helicopter Safety Consultant Roy Fox. The FAASTeam is committed to the reduction of helicopter accidents and encourages FAASTeam members as well as other airmen to review this valuable source of safety information.

The latest edition, Volume 22, No. 3, of the HELIPROPS newsletter is now available at:

English:

http://www.bellhelicopter.com/MungoBlobs/764/154/Vol_22_Number_3_En.pdf

Spanish:

http://www.bellhelicopter.com/MungoBlobs/688/156/Vol_22_Number_3_Sp.pdf

Patient Safety Leaders Propose 'NTSB for Healthcare'

Successful safety efforts from aviation provide critical lessons for addressing the "crisis of waste and harm" in the U.S. healthcare system, according to a special article, "An NTSB for Healthcare – Learning from Innovation: Debate and Innovate or Capitulate," in the April issue of the Journal of Patient Safety. An independent body modeled after the National Transportation and Safety Board (NTSB) is a promising approach to combat the systemic issues compromising patient safety, according to the article, authored by a quartet of pilots and safety experts with special experience in the "overlap between aviation and healthcare." "All four of us know that an NTSB type program for healthcare and more aggressive adoption of aviation best practices will save lives, save money, and bring value to our communities," write the authors, led by Dr Charles R. Denham. Dr Denham is Founder and Chairman of the Texas Medical Institute of Technology (TMIT), a private, not-for-profit medical research organization that supports development and dissemination of patient safety practices.



His coauthors are US Airways Flight 1549 pilot Chesley B. "Sully" Sullenberger; actor turned patient safety advocate Dennis Quaid; and aviation safety expert John J. Nance. Their article, in print and online now in the Journal of Patient Safety, introduces some of the ideas discussed in a new TMIT documentary, titled "[Surfing the Healthcare Tsunami: Bring Your Best Board.](#)" The documentary will premiere on April 27 at the National Press Club in Washington, D.C.

In the article, Denham and colleagues highlight some key similarities between healthcare and aviation: "[High risk and complexity, [dependency on human performance factors](#), and the potential to generate highly reliable performance ONLY IF basic safety principles are provided by invisible support systems."

In aviation, cooperative efforts between government agencies and industry have led to remarkable improvements in safety. Since the introduction of the Commercial Aviation Safety Team in 1998, the fatality rate of commercial air travel in the United States has decreased by more than 80 percent.

Those unprecedented gains have led some observers to suggest that a similar approach could help to address the ongoing crisis in healthcare—including [high rates of medical errors](#) leading to patient harm and chronic waste of healthcare resources. Expressed in aviation terms, the losses are equivalent to 20 Boeing 757 airliners crashing each week, with \$10 million in each cargo hold.

Denham add their voices to the call to establish an "NTSB for healthcare"—an independent agency that, like the NTSB, views every death as a preventable occurrence. When it concludes investigations of aviation accidents, the NTSB issues "Blue Cover Reports" on its findings and recommendations.

An NTSB for healthcare could issue "Red Cover Reports" sharing the "experiential safety information" that is absolutely essential to reduce patient injuries. Currently, this information is "[submerged](#)" by fear of litigation and lack of co-operation within the healthcare profession. A series of Red Cover Reports on the most important safety problems would provide a "disciplined, systematic approach" to understanding the causes of preventable patient harms—and, most importantly, what must be done to keep such events from happening again.

The authors believe that "Ground Zero" in the war against healthcare waste and harm is the decisions made and policies set by healthcare trustees and administrators in the boardroom—which set the stage for the actual provision of care at the patient's bedside. "High performance care and safe care exist at the intersection of leadership, practices, and technologies," they write.

Produced in collaboration with other patient safety leaders, Surfing the Healthcare Tsunami is the latest in a series of TMIT documentaries highlighting "extraordinary impact through ordinary things." The producers hope it will provide [a call to action for all people](#) interested in healthcare to repair, develop, and enhance the invisible safety-net that keeps patients and caregivers safe.

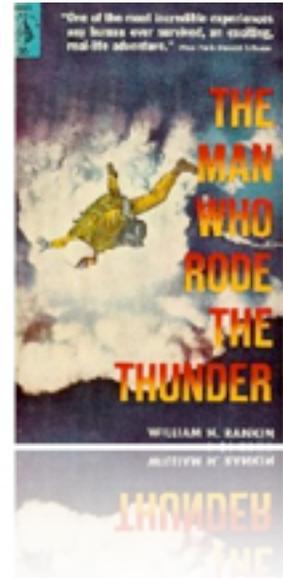
Surfing the Healthcare Tsunami will appear on the Discovery Channel on April 28, with repeated showings over subsequent weeks. In the second part of their article—to be published soon in Journal of Patient Safety—Denham and coauthors "challenge healthcare suppliers, providers, and purchasers to become role models and fully embrace patient-value-centered-care that has as an intrinsic property safety and avoidance of healthcare harm."

Video: William Rankin, the Man Who Rode the Thunder

The story of William Rankin's ejection at 47,000 feet and 500 knots is legendary, only because the fall took him 40 minutes, but also because he lived to talk about. There are other and more recent cases of people who have been drawn into thunderstorms under canopy and not every one ends in survival.

http://www.youtube.com/watch?v=0cqQzcChFG0&feature=player_embedded

<http://www.damninteresting.com/rider-on-the-storm/>



The Number One Cause of Accidents: Human Error

It makes good sense to me that if the acknowledged number one cause of helicopter accidents is identified as "Human Factors," then I also believe it to be a good idea to learn about that problem area in order to find solutions. There are many good resources for the aviator, mechanic or anyone involved with planning executing a flight to learn about [human factors](#) as they apply to making errors.



But, a common mistake by people when asked the question, “what is the number one cause of aircraft accidents?” is that most will answer, “Pilot Error.” Certainly, pilots make errors, cause accidents and usually make the front page of newspapers in the process.

Less talked about are the errors [made by others involved with the flight](#) such as maintenance, dispatching, management or supervision, to name a few. Should you want to learn more, start with three basic human factor areas discussed by aviation safety professionals. They are physiology, psychology and ergonomics.

The threat to our industry is real. Fortunately, there are industry and safety organizations dedicated to reducing helicopter accidents. The American Helicopter Society, International (AHS) www.vtol.org, the International Helicopter Safety Team (IHST) www.ihst.org and the Helicopter Association International (HAI) www.rotor.com offer courses at their conventions, seminars and on their websites. In the United States the FAA created an entire online program, called the FAA Safety Team or FAAST. The web address for FAA certified pilots and mechanics is www.faasafety.org. Offered are the “Wings-Pilot Proficiency Program” and “AMT-Awards Program” for maintenance personnel. Most worldwide civil aviation authorities offer similar safety programs.

Headache-Inducing Foods

Try avoiding these common triggers

From tension headaches to migraines, there are many varieties of head-pounding pain. And although several different triggers may be to blame, like stress and allergies, some experts believe [that certain foods](#) can cause in some people. "It is not unusual at all for food to trigger migraines or other types of headaches," says Noah Rosen, MD, Director of the Headache Institute at North Shore-LIJ Health System in Long Island, New York.

Many migraine sufferers are willing to try an array of methods to get rid of the pain. In addition to other remedies, the Mayo Clinic suggests pinpointing foods that may be triggering the migraines. Common culprits include the sulfites commonly found in alcohol (especially beer and red wine) and



chocolate. While sometimes used as a migraine treatment, [too much caffeine, and even caffeine withdrawal, can cause headaches in many people](#). The artificial sweetener aspartame can also bring on a migraine.

Dr. Chris Iliades, MD, notes that aged cheese can cause your head to start hurting thanks to tyramine, a substance that forms as the proteins in cheese break down over time. The longer a cheese ages, the more tyramine it has. You may want to avoid blue cheese, Swiss, cheddar, Gouda and parmesan if you find you are among those sensitive to tyramine.

While bananas are a healthy snack, people sensitive to tyramine may want to avoid them also. Dr. Iliades notes that, like aged cheese, banana peels contain a significant amount of tyramine, around 10 times more than does the banana pulp. If you don't want to avoid bananas altogether, try weeding out those stringy pieces of inner peel. Dr. Iliades also points to monosodium glutamate (MSG), which can be found in soy sauce and as an additive in many other foods.

The Mayo Clinic notes that [skipping meals](#) can cause a headache or migraine, so if you want to avoid one of the above foods, try to find a better alternative rather than missing out on a snack or meal. The best way to tell if specific foods are causing you headaches is to keep a food and headache diary. Keeping track of what you eat and when you suffer from headaches can help you and your doctor detect possible food reactions.

For more information about headache prevention, visit the Mayo Clinic at www.mayoclinic.com/health/chronic-daily-headaches/DS00646/DSECTION=prevention.

Picture This

