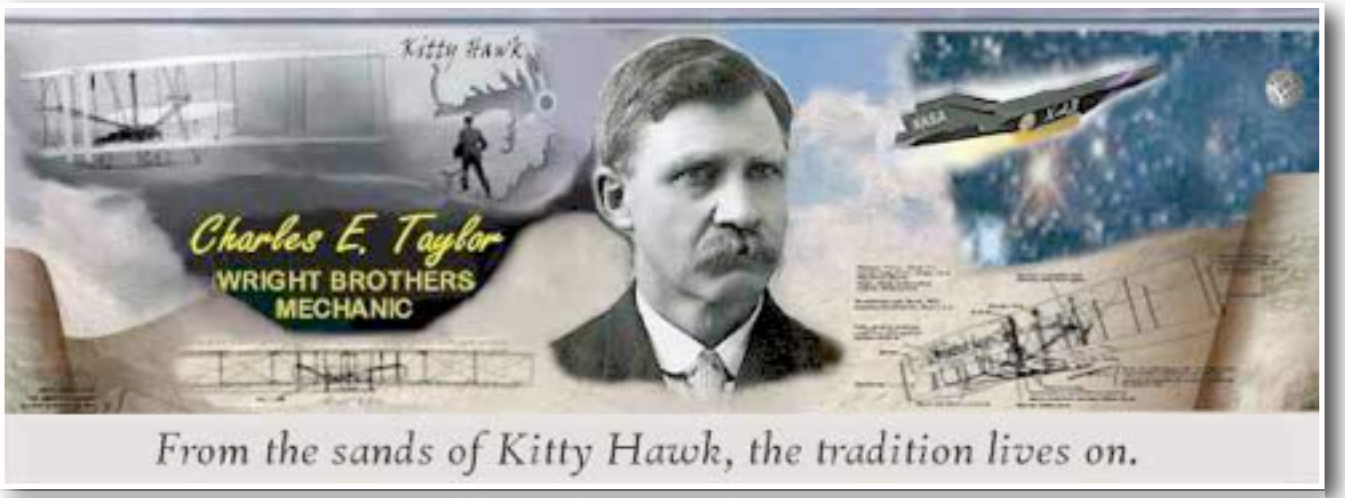
Aviation Human Factors Industry News

Volume XI. Issue 08, April 19,2015



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:

France's ISAE studies reasons for pilot error

Pilots make mistakes. Mistakes are a product of the brain. If it were possible to identify the common neurological precursors for pilot errors, it might be possible to prevent them.

That, at least, is the theory on which the Institut Supérieur de l'Aéronautique et de l'Espace in Toulouse is working. Prof Frédéric Dehais, who holds the AXA chair of neuroergonomics for flight safety at ISAE Supaero, describes the research program he is heading as a merger of neuroscience, human factors and computer science.A Boeing study quoted by Dehais shows that, between 2002 and 2011, 1,493 people died in some 50 in-flight loss-of-control or controlled flight into terrain accidents. “In the majority of these stressful but recoverable situations”, he says, “it appeared that the crews were unable to identify the problem, and continued to take irrational decisions that did not make sense according to what was happening.” Even the intervention of audible alerts made no difference to the crew’s persistence with a doomed strategy.

“Accident analysis reveals that the complexity of modern transport aircraft can overwhelm the most experienced crews when something goes wrong,” Dehais says. “They can become confused, stressed, and fail to assess the criticality of the situation. They also persist in erroneous courses of action despite auditory and visual warnings in the cockpit. In the end, they crash.”

He adds: “These dramatic events are surprising because the pilots are supposed to be highly trained. There is a need to understand what kind of neural mechanisms are leading to these situations.”

This program uses a unique range of neural measurement techniques while putting pilots through flying tasks in a flight simulator. “The purpose of my research is to uncover the underlying neural mechanisms of human error that lead pilots to persist in irrational behaviors,” Dehais says.

Serious accidents may be rare, but 70% of them result from human error, so a deeper understanding of the nature of error and what causes it is an important objective.

“Our approach combines cutting-edge brain imaging, signal processing and artificial intelligence techniques as well as a unique methodology from basic protocols to ecological experiments,” explains Dehais. “Results from this research will be strongly beneficial to aviation safety, leading to the implementation of innovative solutions to mitigate human error.”

Tools used to monitor pilot reactions during flight simulator exercises – and real flights – include eye-tracking, measurement of pupil dilation, electro-encephalograms to track deep brain activity, and infrared sensors that can show activity in critical surface brain areas, as well as advanced brain imaging and signal processing techniques.

Pupil dilation is a reliable external indicator of mental stress, says Dehais, and there are now very precise ways to monitor it. The scientists can watch as a highly stressed pilot’s brain literally shuts down many of its critical faculties and shifts from rational decision to emotional reaction. At that point the pilot is in a state of “in-attentional deafness”, where audible alarms and spoken instructions are ignored.

More conventional physiological measurements are also used. The heart rate indicates the levels of mental stress and physical workload. For example, a take-off in a simulator does not raise the heart rate to the degree it does in a real aircraft.

Wired-up pilots flying a real light aircraft are not forced to undergo an actual engine failure, but the throttle is pulled back and the pilot has to look for a forced landing opportunity. Meanwhile his or her brain activity is being measured and recorded so common neurological activity patterns can be identified and related to specific activities and stress levels.

All the same monitoring techniques can also be used for the pilots of remotely operated unmanned aerial systems.

Backed by the AXA Research Fund, the ISAE is working to identify the patterns of neurological activity that occur when pilots become confused, overloaded, or focused on non-critical inputs to the exclusion of critical ones. If one can identify and understand the neurological reaction, says Dehais, it is possible to apply what he calls “cognitive countermeasures”.

In the AXA-ISAE project, Dehais is working in parallel with research being carried out at NASA's Ames Research Center, Stanford and Harvard universities, the Centre for Information and Neural Networks in Japan, and Laval University in Canada.

Artificial intelligence may still be thought of as being in the realms of science fiction, but ISAE believes it may be used in the recognition of overload and the timely deployment of appropriate cognitive countermeasures.

Even factors such as "emotional bias" can be recognized. ISAE says this is caused by pressures from "outside the cockpit", such as pilot perception of commercial pressure to land when a go-around would be wiser. The ISAE has tested the cognitive effect of emotional bias by offering pilots a financial benefit to land versus a small financial penalty for a go-around, and have observed in their brain a greater degree of neurological stress during the decision-making process, because it is no longer a decision affected purely by operational considerations. The effects on brain activity of ambient light, fatigue and age can also be identified, as can the effectiveness of mitigating techniques for each of those.

Knowing, as neurologists now do, which parts of the brain control specific functions, the ISAE scientists can predict which tasks the pilot will no longer be able to perform as the stress increases.

There are traditional ways of helping pilots deal with stress. Good training and high levels of knowledge in a pilot mean that he or she is less stressed by any given situation than a pilot with poor training and knowledge, and the ISAE says this is visibly true. But the institute is looking beyond the traditional to what else will be effective.

This new level of neuroergonomic understanding promises to enable manufacturers to eliminate alerts and other stimuli that do not work, and develop completely new "cognitive countermeasures" designed to attract the attention of pilots whose cognitive capacity has been swamped.

An example of such a system is a window appearing on the navigation display showing an animation of a pilot carrying out the required action to ensure recovery. Neurologists know that, when all else fails, they can invoke the human imitative function – the one that makes a person yawn when someone else yawns.

Another "cognitive countermeasure" that the ISAE has found to be highly effective is, when a pilot is clearly focusing on one information source to the exclusion of other critical ones, to remove that information completely.

The pilot's instrument panel scan immediately switches elsewhere looking for information to replace the removed data, and discovers important information he or she has been missing.

Previous approaches to dealing with common mistakes have included multiplying the number of alerts, including audible or spoken alerts. ISAE explains that, beyond a certain point, this can be at best pointless and at worst counterproductive, increasing stress and narrowing a pilot's focus further. So it makes sense to understand what happens to pilots' cognitive functions when they are stressed.

Neuroergonomics has enormous potential. It could be used during the pilot selection process, and also for monitoring the effectiveness of training techniques or of different cockpit designs.

The ability to identify "emotional bias" could eliminate speculation about whether pilots who work for airlines that require them to be self-employed and paid by the hour are under more stress than pilots with a salary and incentives. The accuracy of the observations is such that it might be able to indicate the kind of mistakes pilots under emotional stress are more likely to make.

Dehais points out that the ISAE research has applications to other people who work in high stress, safety-critical jobs, such as surgeons and those at the front line in nuclear power control.

Whatever else the ISAE's continuing research discovers, this project has huge potential to advance mankind's understanding of aviation human factors.

Tale of worker asleep in cargo hold is a warning

The misadventure of a baggage handler who fell asleep in the cargo hold of a jetliner should be a warning for airlines to improve security procedures, safety experts said Tuesday.

The worker banged on the plane for help shortly after takeoff on Monday from Seattle. Pilots heard the noise and quickly returned to the airport.

The worker was not injured.The Federal Aviation Administration was investigating, but few new details emerged Tuesday about the bizarre incident.

Alaska Airlines has said the leader of a baggage-loading crew noticed the worker was missing and tried to call and text him before concluding he had gone home when his 9 1/2-hour shift ended.

Safety experts say the crew should not have closed the cargo doors of Flight 448 to Los Angeles until they had accounted for the missing worker.

"This is a 'huh?' moment," said Thomas Anthony, director of the aviation security program at the University of Southern California and a former FAA official.

"That supervisor said, 'Huh, I wonder where Louie is?' The 'huh' is a yellow light that you need to pay attention to," he said. "The worst thing you can do is just say, 'It's probably nothing.'"

Anthony said airports are responsible for screening workers with access to planes while airlines are responsible for the security of an aircraft.

A U.S. aviation official said there is no legal requirement that airline crews check a cargo hold before every flight. The person spoke on condition of anonymity because airline security programs contain sensitive information and are not public documents.

Investigators are likely to examine how the worker got left on the plane with luggage that had been screened.

"How do you have something in the cargo bin that you don't know is there?" said John Cox, a safety consultant and former airline pilot.

The flight carried 170 passengers and six crew members. It was more than an hour behind schedule when it eventually arrived in Los Angeles, the airline said. There was no immediate word on how much the delay cost the airline.

Such incidents are rare but have occurred.

— In 2011, a US Airways bag handler was accidentally locked inside the cargo hold of a plane at Reagan National Airport. A passenger heard the man banging on the underside of the floor and alerted a flight attendant.

— In 2009, a bag handler for JetBlue flew from New York to Boston in the cargo hold. The 21-year-old said he fell asleep and panicked when he realized the plane was in flight. He used his cellphone to call the airline during the flight.

— In 2005, a bag handler at LaGuardia Airport in New York fell asleep in the belly of a Spirit Airlines plane and woke up in Detroit.

Alaska Airlines said the baggage handler in Monday's incident was in a pressurized, temperature-controlled part of the cargo hold.

That's much safer than aircraft wheel wells, where stowaways sometimes hide with no protection from the thin air and extreme cold at high cruising altitudes. Still, a 15-year-old stowaway survived a flight in a wheel well last year from California to Hawaii.

The Seattle worker put in a long day before dozing off in the cargo bay.

Alaska Airlines said in a statement that he was part of a four-person team loading baggage onto the flight and was scheduled to work from 5 a.m. to 2:30 p.m. Flight 448 left for Los Angeles at 2:39 p.m.

The plane had just departed when the pilots and first-class passengers heard pounding, the airline said. The captain immediately declared an emergency and turned back to Seattle-Tacoma International Airport. The plane was in the air just 14 minutes.

Medics checked the worker, an employee of Alaska Airlines contractor Menzies Aviation, and found he wasn't hurt, airport spokesman Perry Cooper said. The name of the worker has not been released.

The man was also evaluated at a hospital and passed a drug test after being released.

Officials for Menzies Aviation, an English company, did not immediately return messages from The Associated Press.

Airlines are increasingly turning over airport jobs to contractors to save money. Alaska Airlines outsourced bag-handling work at the Seattle airport in 2005.

The Service Employees International Union, which is trying to organize airport workers, said outsourcing has resulted in the hiring of low-wage workers who often hold more than one job and don't work for long as a baggage handler.

"These operations require a stable, well-trained workforce," said Heather Szerlag, a union official. "We see this as a significant problem."

Airline Pilot Training Shift Urged

The company that built its business around automating airplanes is now saying it's time for airline pilots to brush up on their stick and rudder skills. The Wall Street Journal reports that Harry Nelson, the former VP of flight testing and now a product safety executive for Airbus, told the 70th annual meeting of the International Federation of Airline Pilots Associations in Madrid on Saturday that pilot training should be revamped to put more emphasis on hand flying. He said airline training is too focused on meeting regulatory requirements and recurrent training is too weighted toward assessing skills rather than teaching and fostering them. That, he says, makes the regular sim sessions and check rides dreaded threats to job security. “There is no perceived upside to the training,” he said. “And that’s wrong.”Nelson said there is another perhaps more insidious dynamic at work in an age where most of a pilot's time is spent inputting data and monitoring systems. “It used to be cool to be a pilot,” Nelson said. "For a lot of pilots it’s just another job.” Nelson said refocusing pilot training will require a wholesale rewrite of curricula and it might require additional training time. He also said time is running out to capitalize on a huge training resource: old-hand pilots with actual hand flying experience in life-threatening circumstances. “Tomorrow’s instructors will not be teaching from personal exposure,” he said. “They’ll be speaking from hearsay.”

Business Aviation Safety Losses 2014

The year 2014 was another disappointing one, with business jet aircraft experiencing the worst fatal accident rate in recent years.

The accident rate for business turboprops did improve last year in comparison to 2013 and 2012, but it was similar or worse than the rates for 2009 through 2011.

The long-term trend in the accident rates for business turboprops is improving, but that for business jets seems to have largely stalled over the last 10 years.

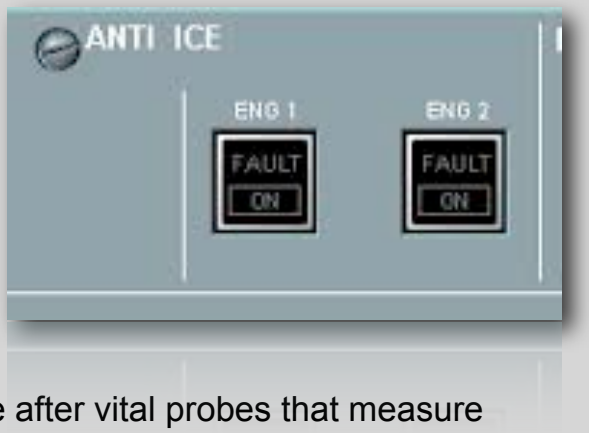
https://d1fmezig7cekam.cloudfront.net/VPP/PageFiles/41155/BusinessAviationSafetyLosses2014.pdf

NTSB Issues GA Safety Alerts

The NTSB issued four safety alerts on Tuesday, highlighting safety issues relevant to general aviation pilots and mechanics. The alerts warn pilots to master mountain flying skills and emergency survival procedures before venturing into the mountains, seek transition training before flying an unfamiliar aircraft, and perform thorough preflight checks on airplanes after maintenance. The mechanics' alert offers advice on avoiding mis-rigging mistakes. The safety board said it has identified these issues based on several recent investigations.Each of the alerts includes summaries of accidents and an exploration of the safety issues involved. The alerts also provide advice on how to apply the lessons learned and information about where to find educational resources to learn more. The new safety alerts, along with dozens of others previously released by the safety board, can be found at the NTSB website.

http://www.ntsb.gov/safety/safety-alerts/Pages/default.aspx

Pilots to be warned over icing after 2014 Mali air crash



Aviation regulators are expected to issue new advice to pilots after investigations into the crash of an Air Algerie jet in Mali last July found it went out of control after being hit by ice as an anti-icing system remained switched off.

France's BEA crash investigation agency, which is helping Mali to investigate the crash that killed 116 people, said the MD-83 jet appeared to have run into trouble after vital probes that measure pressure on the engine inlets blocked up with ice.

Properly working probes are needed to help the McDonnell-Douglas aircraft measure the thrust of its engines.
With the probes iced up as the Algiers-bound jet skirted a storm, the plane's autopilot thought the power was too high and slowed the engines below the level needed to maintain cruise height, starting a chain of events that sent it out of control, BEA said on its website.

The statement explained some of the causes of the crash and said it had notified U.S. and European regulators who would issue the new guidance.

Investigators have been hindered by damage to "black box" cockpit audio recordings, which were unusable, but have spent months reconstructing engine settings from the data recorder of the MD-83 jet which was operated by Spain's Swiftair.

Data analyzed suggested the crew had not activated a de-icing system designed to protect the engine inlet probes.

The icing over of the pressure sensors is the first possible cause of the crash to be put forward by the investigators.

As it fell towards the ground, the jet rolled suddenly to the left and pointed almost straight down, the BEA said.

The crash is one of several accidents in which an aircraft is thought to have lost control at high altitude, putting the spotlight partly on training to help pilots identify and then deal with an aerodynamic stall, or loss of lift.

The BEA said black box data did not provide any indication the crew had used stall recovery maneuvers, but said the investigation was continuing, with a final report expected in December.

It said a similar situation had started to unfold on a similar plane operated by Swiftair less than two months before the Mali crash, but without serious consequences.

In June 2002, a McDonnell Douglas MD-82 jet operated by U.S. carrier Spirit Airlines suffered a loss of thrust on both engines.

The BEA said it had shared information on all these incidents with the regulators who would soon issue the guidance to help pilots identify similar problems.

McDonnell-Douglas was bought by Boeing in 1997.

Sea-Tac Ramp Agent Paralyzed In Accident Awarded $40 Million Judgment

Brandon Afoa sued the Port of Seattle, which runs the airport, in 2009, claiming it failed to provide a safe working environment, which contributed to the accident that left him without the use of his legs and right arm.

A King County jury has awarded $40 million to a Puyallup man paralyzed while working at Sea-Tac Airport. The verdict in favor of Brandon Afoa came Tuesday.

Afoa sued the Port of Seattle, which runs the airport, in 2009, claiming it failed to provide a safe working environment, which contributed to the accident that left him without the use of his legs and right arm.Afoa was hurt when the vehicle he was driving, which is called a pushback or tug, lost its brakes and steering and crashed into a broken cargo loader in the airport's South Satellite area. The vehicles are used to push large aircraft away from gates.

The wreck occurred Dec. 26, 2007. Alfoa was 25 at the time.

Among other arguments, Afoa contended that the airport allowed "excessive clutter" to accumulate in the ramp area where the crash occurred.

Airport lawyers countered that the accident was caused solely by the malfunction of the pushback's mechanical systems, which were to be maintained by the company for which Afoa worked.

The airport had no duty or responsibility to ensure that Afoa's employer, Evergreen Aviation Ground Logistics Enterprises, properly maintained its vehicles, airport lawyers argued.

"There is no evidence that the plaintiff's accident would have occurred had the brakes and steering not failed," airport lawyers wrote in pleadings.

The jury saw it otherwise, and apportioned 25 percent of the blame for the accident to Sea-Tac Airport.

Jurors said a number of airlines, who weren't part of the lawsuit, bore the majority of the rest of the blame. The jury also said Afoa was 0.2 percent negligent.

Afoa's attorney, Raymond Bishop, said Thursday that it will be up to King County Judge Judith Ramseyer to determine how much of the judgment will be the port's responsibility.

Lawyers for both sides are preparing written pleadings with their positions, Bishop said.

"Right now, nobody knows," he said.

Forgotten cleaning rag a risk to Qantas jet

A cleaning rag left behind during maintenance of a Qantas Boeing 737 was found trapped inside a cable drum during a routine inspection at Auckland Airport.

The rag had caused some damage and compromised the plane's stabilizer trim system manual control, a report into the incident found.

It was one of two incidents within a year where rags were left inside Qantas aircraft following maintenance.

A Transport Accident Investigation Commission (TAIC) report found the rag was likely to have been left inside the aircraft in the Qantas Sydney maintenance hanger.The Boeing 737-838, operated by Qantas subsidiary Jetconnect, was undergoing an overnight inspection in Auckland in June 2013 when an engineer inspecting the forward electronics and equipment compartment found metal filings.

The filings were near the cable drum of the stabilizer trim system, a flight control system that adjusts the amount of downwards or upwards aerodynamic force produced at the tail of an aircraft in flight.

The engineer found a rag had been caught under the cable wound around the drum, causing a bulge in the cable. This was wearing against aluminum spacers around the drum, damaging steel bolts holding them in place, and putting extra tension on the cables.

The trim cables, drum and pulleys were replaced before the aircraft was returned to service.

Testing of the rag showed it was the same type used in the Qantas maintenance facility in Sydney.

The TAIC report said in another incident in September 2013, a Jetconnect Boeing 737-838 flying from Melbourne to Wellington had trouble retracting its landing gear, and was found to have a rag wrapped around the landing gear assembly.

A Qantas investigation found the rag had been left behind after maintenance.

TAIC said the key lesson was that personnel should take care not to leave anything inside aircraft, particularly in areas or near systems critical to flight safety.

A Qantas spokesman said while the incident was a very rare occurrence, it had improved processes within the engineering department to ensure items were not left behind during maintenance checks.

"This particular aircraft is a next generation Boeing 737-800, which has some of the most modern and sophisticated systems in aviation, and at no time was the safety of the aircraft compromised."

INTERIORS: Jetstar uses RFID for safety checks

Australasia's Jetstar Airways has drastically cut the time required to check on-board safety equipment by using a new Radio Frequency Identification (RFID) solution.

"We have a range of on-board safety equipment that must be regularly checked and tested by our engineers and our previous manual inspections could take up to 10 man-hours," says David Lau, Jetstar Australia and New Zealand head of engineering."With RFID technology the inspections can now take fewer than five minutes."

EAM RFID Solutions, which specializes in RFID equipment for airlines, aircraft operators and MRO facilities, provided the hardware.

"We're now using RFID to track and trace life vests as well as other safety equipment items that need to be replaced from time to time such as life rafts, oxygen generators…fire extinguishers and oxygen bottles," said Lau.

"The use of RFID for the inspection of cabin equipment expiry dates significantly reduces regulatory non-compliance risk."

RFID-enabled safety equipment was installed on Jetstar's first Boeing 787 and Airbus A320 in late 2014. Jetstar Australia and New Zealand will equip all its aircraft with RFID this year.

Heavier fines due for flight safety breakers

Airline companies will be fined triple the current amount for violating safety-related rules after being given improper orders by their executives.

In addition, people convicted of violating the Aviation Law will be barred from working as executives at airlines for five years, up from two years.

The Ministry of Land, Infrastructure and Transport announced these revisions to related regulations at a public hearing in Seoul, recently.

The measures follow the "nut rage" incident in which then-Korean Air executive Heather Cho interfered with a flight because she was angered at how nuts had been served by a flight attendant.
"In order to improve risk prevention and control, we are proposing stronger punishment for those endangering safety, including managers of airline companies," said a member of a special committee at the ministry.

A company currently has to pay 600 million won if an executives force a plane to take off despite engine problems and the aircraft then has to return to the airport of departure due to the problem. The new fine will be 1.8 billion won.

The ministry will also increase the fines for passengers who interfere with the work of pilots or flight attendants from the current 5 million won to 50 million won, with the possibility of a prison term of up to five years.

Aside from security-related issues, the ministry is also working on severing its "corrupt ties" with Korean Air, after a member of the ministry's inspection team for the "nut rage" incident — a former Korean Air worker — leaked details of the investigation to the firm.

The ministry said this is because 88 percent of its aviation safety inspectors are former Korean Air employees. It plans to hire people from other domestic and foreign airlines from now on, so that the level will drop to less than 50 percent by 2019.

Cho was indicted for ordering a Korean Air plane bound for Incheon to return to the gate from a taxiing area at JFK International Airport in New York on Dec. 5 and kicking a chief flight attendant off the plane because she was dissatisfied when a junior attendant served her macadamia nuts in a bag, not on a plate.

Third of Military Get 5 Hours or Less of Sleep

About a third of military members get by on five hours of sleep a night or less, and another third only manage six hours a night. Only 8% of civilians get by on five hours of sleep or less, as measured by the Centers for Disease Control and Prevention.

The study, conducted by Rand Corp, reported that almost half of service members said they sleep poorly, compared to about a third of the general population. And sleep problems occur at the same rate throughout the military, regardless of whether people are deployed.More than 18% of those surveyed reported using sleep aids such as sleeping pills, which have side effects that present a safety risk in an operational setting.

The study confirms that lack of sleep can have serious consequences for brain function and psychological health, according to US Public Health Service Lt Evette Pinder, a psychological health epidemiologist at Deployment Health Clinical Center.

Resilience, emotional regulation, and interpersonal relationships are impaired by sleep deficiency. The survey analysis supports a link between sleep quantity and quality, and physical health problems, such as obesity, and reports that sleep problems are a risk factor for depression and post traumatic stress disorder.

According to the survey, a third of service members feel fatigued at least three to four times a week, and 17% reported that lack of sleep impairs their ability to function.

Finding easy solutions for sleep-deprived service members can be complicated. Common barriers keeping our warriors from getting adequate sleep include:

- **Attitudes.** Sleep is viewed as a luxury in the military, and those who insist on getting to bed may be viewed as slackers.
- **Manpower.** Service members say they often work fatigued because there's no one to replace them.
- **Shift work.** Many war fighters report taking coffee or energy drinks to keep them awake at night and medications to help them sleep during the day. These practices hurt sleep quality.
- **Information.** Service members and care providers aren't informed about how to solve sleep problems.
- **Providers.** Not enough military care providers are trained to treat sleep issues.

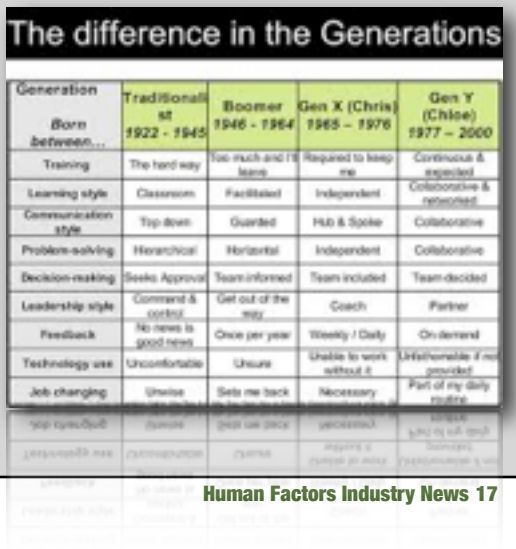
The report recommends the Defense Department take steps to prevent sleep problems, increase identification and diagnosis of sleep problems, clinically manage sleep disorders and promote sleep health, and improve sleep in training and operational contexts.

A new research report sponsored by the Defense Centers of Excellence for Psychological Health and Traumatic Brain Injury confirms what many in the military have long suspected: Service members don't get nearly enough sleep.

Study Shows Impact of Generational Differences in the Workforce

LifeCourse Associates has released *Why Generations Matter*, a research report that uncovers what each generation values in an employer and how well that needs of different generations of workers are-or are not-being met.

This is the most comprehensive quantitative study performed on generations in the workforce," says Warren Wright, vice president of LifeCourse Associates.



Wright adds, "We now know what engages different generations."The study included Millennials (age 30 and under), Generation X (ages 31 to 51), and Boomers (ages 52 to 69) who are employed full-time. The survey was conducted through a nationally representative online panel of 1,250 respondents, and was tested again on 4,986 insurance industry employees 2 months later.

Key Findings

- **Generations matter.** Nearly three-quarters of respondents agreed, not only that there are important generational differences but also that they "sometimes" or "often" pose challenges in the workplace.
- **Millennials crave mentorship.** Nearly a third of Millennials "strongly" agreed that they want to work for an organization that provides an excellent mentoring program, far more than any other generation. Millennials also experience the largest gap between what they have and what they want when it comes to mentoring.
- **Millennials want a social workplace.** An overwhelming 68 percent of Millennials agreed that they like to socialize informally and make new friends while at work, about 10 points higher than any other generation.
- **Millennials want to contribute.** Nearly two-thirds of Millennials agreed that they like their employer "to contribute to social and ethical causes" that they think are important, vs. barely half of Boomers and older Gen Xers.
- **Millennials and Xers want cutting-edge technology.** High shares of both Millennials and Gen Xers "strongly agree" that they "like to work with state-of-the-art technology," while Boomers rate this as significantly less important. Millennials rate their employers' performance in this area the lowest.
- **Boomers are mission-focused.** Fully 56 percent of older Boomers and 50 percent of younger Boomers "strongly agree" that they want to be "100 percent dedicated to my organization's mission." That number declines sharply for older Gen Xers and continues to decline through Millennials, in a remarkable 19-point generational spread.

The report is part of LifeCourse's new *Generational Workforce Audit*, a customized research tool to diagnose how generational engagement affects an organization's bottom line. For more information, visit www.lifecourse.com.

Why It Matters

- Every generation in your workforce needs to be trained to work safely.
- Since the generations grew up in different eras, you must use a variety of different training methods to reach every generation effectively.

- Make full use of a blended learning approach to ensure that employees of all ages can learn to work safely.

‘Journey to Space’ and ‘Living in the Age of Airplanes’ arrive at the Naval Aviation Museum

The Naval Aviation Museum Foundation invites audiences to ride along with two new large-format films opening at the National Naval Aviation Museum’s IMAX® Theatre on April 10.

Actor and pilot Harrison Ford narrates the National Geographic Studios feature, “Living in the Age of Airplanes.” The film takes audiences around the globe on an epic journey to 95 locations in 18 countries spanning all seven continents to remind us how, in a single century, aviation has changed our world forever.

Directed by Brian J. Terwilliger with an original score by Academy Award®-winning composer and pilot James Horner (“Avatar,” “Titanic”) and cinematography by Andrew Waruszewski, ”Living in the Age of Airplanes” offers a fresh perspective on a modern-day miracle that many of us take for granted – flying.The film highlights the astonishingly rapid advancements that have lead to a world in which 100,000 flights take off and land every day.

“Since we were all born into a world with airplanes, it’s hard to imagine that jet travel itself is only 60 years old, just a tick on the timeline of human history,” said Terwilliger. “With this film, we want to reignite people’s wonder for one of the most extraordinary aspects of the modern world.”

The second feature film, “Journey to Space,” presented by K2 Communications and Giant Screen Films, explores the next steps for human space exploration.

Narrated by prolific actor Sir Patrick Stewart, celebrated for his roles as Captain Jean-Luc Picard in “Star Trek: The Next Generation” and Professor Charles Xavier in the “X-Men” film series, the film will take audiences on a behind-the-scenes tour of the international effort to send astronauts to Mars within the next 20 years.

"Journey to Space" showcases the concepts, hardware and people that will carry out the next generation missions that will make humanity a spacefaring species.

"It was a delight to contribute to this exciting film project, which will let audiences young and old know how surprisingly close we are to sending humans into deep space," said Stewart.

Director Mark Krenzien added, "Patrick's narration is the perfect icing on our space-story cake. Everyone in the studio was beyond impressed by his enthusiasm for the project and his dedication to every nuance and detail."

To view the "Journey to Space" trailer online, visit: http://journeytospacefilm.com/.

To view "Living in the age of Airplanes, visit: http://www.navalaviationmuseum.org/attractions/imax-theatre/living-in-the-age-of-airplanes/

TED - Ideas Worth Spreading

5 Ways To Kill Your Dreams

All of us want to invent that game-changing product, launch that successful company, write that best-selling book. And yet so few of us actually do it. TED Fellow and Brazilian entrepreneur Bel Pesce breaks down five easy-to-believe myths that ensure your dream projects will never come to fruition.

http://www.ted.com/talks/bel_pesce_5_ways_to_kill_your_dreams