

Aviation Human Factors Industry News

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

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:

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★Workers Rate Safety Most Important Workplace Issue

★Study of Aviation Maintenance Instructors Under Way - Time running out.

★Flight Stress

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SHELL Model is the foundation to understanding Human Factors in Aircraft Maintenance

Using models to explain complex systems are useful in giving a visual of how elements of these systems interact and affect one another. The cornerstone of human factors (HF) theory is the **SHELL Model**. The human, or in the case of aircraft maintenance, the **aircraft mechanic**, is the center of this model.

Plenty has been written on the SHELL Model. As with any theory, concept or model they are limited in their usefulness unless they are put into practice. How the center, human component of this model interface with the various elements and how this interaction with these elements potentially **create errors**, is the key to understanding it.



SHELL Model

How can the mechanic transform this model into a practical tool that can be used everyday?

The first step is creating awareness.

As an example of **“S” (software)**, a **poorly written procedure** that is sitting on a shelf in a technical library is not doing anything to affect the airworthiness of an aircraft until the mechanic picks it up and begins to use it.

This interaction now becomes dynamic and alive, with the potential to **induce an error into the system** unless recognized, captured and contained before it can result in a negative outcome.

The **“H” (hardware)** element could be the aircraft type the mechanic is working on or a piece of test equipment used to troubleshoot a system. Is the mechanic familiar with and properly trained on the equipment? Creating this awareness and taking action is the responsibility of the mechanic. A good tool here would be **just to ask for help** or if no help is available, do not attempt the job.

Mechanics do not have much influence over the “E” (environmental) elements they must work in, but they can be made aware of the types of risks that they may face when working in such environments. This could be something as simple as lighting the work area, adding ventilation or wearing a safety harness when working at heights.

One of the “L” (Liveware) elements is other people. Usually mechanics do not work alone. They interact with other people. Are there communication issues with coworkers, maybe a language or cultural barrier preventing the flow of important information such as a shift turnover or interpreting tech data? Recognizing and then acting on communication issues with others will help prevent errors. Again, awareness is the key.

The mechanic as the other “L” (Liveware) and center component of this model should be aware that whatever stresses or baggage they carry simply walking into the hangar to begin work has as much impact on the system as the other elements have potential to affect them. These are the natural limitations of every human; it’s what makes us unique individuals. For instance, the mechanic may have a family issue they are dealing with, maybe a sick child, or other family member. A distraction such as this could result in an error being made. Does the mechanic have adequate knowledge, training and experience to perform the task? Is the mechanic fatigued? These types of factors, unless recognized, have the potential to have a negative outcome on the airworthiness of an aircraft.

Educating the mechanic and creating an awareness of how these factors influence ones decision making process is the first step. Putting this tool into the hands of the mechanic to practically apply this concept will reduce errors and help prevent accidents and incidents.

<https://hfskyway.faa.gov/hfskyway/opsmanual.aspx>

Workers Rate Safety Most Important Workplace Issue

More than 85 percent of workers rate workplace safety first in importance among labor standards, even ahead of family and maternity leave, wage, paid sick days, overtime pay and the right to join a union.



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The study, "Public Attitudes Towards and Experiences with Workplace Safety," draws on dozens of surveys and polls conducted from 2001 to 2010 by NORC. This meta-analysis sought to gain a picture of Americans' experiences with workplace safety issues. The study was done for the Public Welfare Foundation, based in Washington, D.C., which includes a workers' rights program.

Despite widespread public concern about workplace safety, the study also found that the media and the public tend to pay closest attention to safety issues when **disastrous workplace accidents occur**. Even during those tragedies, the fate of workers is often overlooked, such as during the recent oil well disaster in the Gulf of Mexico.

"Workplace safety is too often ignored or accidents taken for granted," said Tom W. Smith, director of NORC's General Social Survey (GSS). "It is striking that coverage in the media and public opinion polls have virtually **ignored the 11 workers killed** by the blowout and destruction of the drilling platform."

Questions instead focused on the environmental impact of the disaster and overlooked worker safety, Smith pointed out. But he noted that **"if optimal safety had been maintained**, not only would the lives of the 11 workers been saved, but the whole environmental disaster would have been averted."

Robert Shull, program officer for workers' rights at the Public Welfare Foundation, said, "Workplace safety should be a constant concern. Given the importance that workers themselves place on this issue, we should not have to mourn the loss of people on the job before government and employers take more effective measures to ensure that employees **can go home safely after work**."

The U.S. Department of Labor reported in a preliminary count that the number of workers who died on the job in 2009 fell 17 percent from the previous year, as workers clocked in for fewer hours because of the recession. While Labor Secretary Hilda L. Solis called the results "encouraging," she also noted that **"no job is a good job unless it is also safe"**.

Despite a decrease in workplace fatalities, the study found that reports of workplace injuries remained high.

Although most workers say they are satisfied with safety conditions at work, they also report **job-related stress, a contributing factor to injury**. The most recent GSS study on job-related stress, done in 2006, reported that 13 percent of workers find their jobs always stressful, while 21 percent find their jobs often stressful.

"Exhaustion, dangerous working conditions and other negative experiences at work are reported by many workers," Smith said. "Such conditions mean that workplace accidents are far from rare."

The study done for the Public Welfare Foundation found that about 12 percent of workers reported an on-the-job injury during the past year, and 37 percent said they have required medical treatment at one time for a workplace injury.

"Unsafe working conditions end up costing the public dearly," added Shull. "But no matter what the cost to the general public, the workers and their families pay the highest price."

Study of Aviation Maintenance Instructors Under Way **- Time running out.**

Doug Larson, a graduate researcher at the University of Minnesota, is a survey of maintenance technicians "to look at the experience and education of aviation maintenance instructors and see what it tells us about the job of educating maintenance technicians." He is asking all **aircraft maintenance instructors** to take a 15-minute anonymous online.



"I am constantly looking at how to make maintenance training more effective and efficient," he said. "Back in the early 1990s when the federal aviation regulations were, for the most part, brought into harmony with European requirements, the maintenance regulations under Part 65 were never harmonized with EASA's Part 66. I've been told the NPRM proposing to do so **drew more negative comments** than any other NPRM in the history of the FAA's rulemaking process. What I want to know is whether it makes sense to change our standards to be in compliance with those of the EASA."

Larson said the two primary objections against bringing FAA maintenance training regulations in line with EASA regulations come from individual mechanics and the airline industry.

“Many individual mechanics express the sentiment that the U.S. is the world leader in aviation and there’s no good reason for us to change our way of doing things,” he said.

“The other strong voice against change has been the [air carriers](#), which have been quite vocal about not wanting to have to pay for the additional training costs that would result. The irony is if a carrier is going to operate in Europe it has to comply with EASA regulations in addition to FAA [regulations], thereby making the carrier responsible for monitoring and implementing two sets of regulations.”

Larson said initial maintenance technician training to EASA standards has more required subjects than under FAR Part 65. “For example, the FAA mandates basic math and physics but doesn’t go into much detail. The [EASA goes into significant detail](#) on both subject requirements. Another area is [human factors](#), which the FAA requires under FAR Part 145 for repair stations but says little on the subject when it comes to training mechanics. [The EASA requires a significant amount of human factors training.](#)”

One of the most significant differences between the U.S. and EASA training requirements occurs when a student completes a formal training program.

“Under the FARs the student is qualified to become a rated mechanic, but under EASA [rules] the student must then complete one year of practical, on-the-job experience to be certified,” Larson said.

“The goal of the survey is to create a composite picture of the professionals teaching aviation maintenance while identifying any significant differences [driven by] industry segment, regulatory agency, type of training or type of organization.

The results of this study are intended to provide business leaders, regulators and academics with a perspective on the state of the industry from an important population that has not been studied on this scale before.”

The survey will remain available online through October 15.

<http://umsurvey.umn.edu/index.php?sid=93487&lang=um>

Flight Stress

Stress, Fatigue and Performance in Aviation

While **stress and fatigue** are often dealt with in other books on aviation performance and **human factors**, these realities of human vulnerability are now increasingly seen as central to the effective conduct of flight. **Flight Stress** provides a comprehensive treatment and a better understanding of stress and fatigue as they relate to aviation. It clarifies and distinguishes the concepts of stress and fatigue as they apply to flight, and expounds sufficient theory to provide a principled basis for the consideration and amelioration of stress effects in aviation.

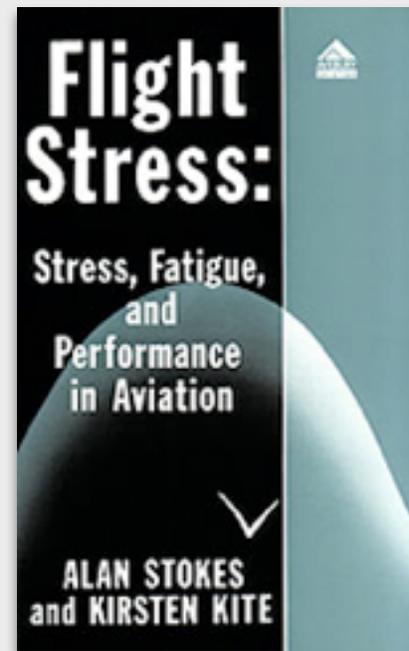
The authors examine what is known of the effects of stress from both laboratory and operational studies and detail the aspects of this knowledge to which aviation professionals should pay most attention.

They go on to discuss the implications of stress and fatigue for performance in a range of aviation contexts, from air traffic control to aerial combat. Physiological, cognitive and medical sequel are explored.

The book locates aviation related work, in its broader research context, critically reviewing and illustrating the work, with examples from accident and incident reports.

It is substantive but accessible, since it both sets out the research base and provides plenty of 'real world' examples to leaven and illustrate the narrative. It thus provides an authoritative handbook for aviation professionals and a comprehensive source book and reference work for researchers.

The readership includes aviation professionals and researchers, including medical personnel and registered Aviation Medical Examiners;



psychologists and **Human Factors specialists**; training captains, senior pilots and engineers; air traffic controllers, dispatchers and operations staff.

Contents: Concepts of stress; Stress and arousal; Pilot performance and stress; Decision making and communication; Life stress; Stress and pilot personality; Fear and stress extremes; Fatigue in flight operations; Transmeridian flight; Stress in air traffic control; Organizations, stress, and accidents; Automation and boredom.

http://www.ashgate.com/default.aspx?page=637&calcTitle=1&pageSubject=453&pagecount=3&title_id=4016&editon_id=6398

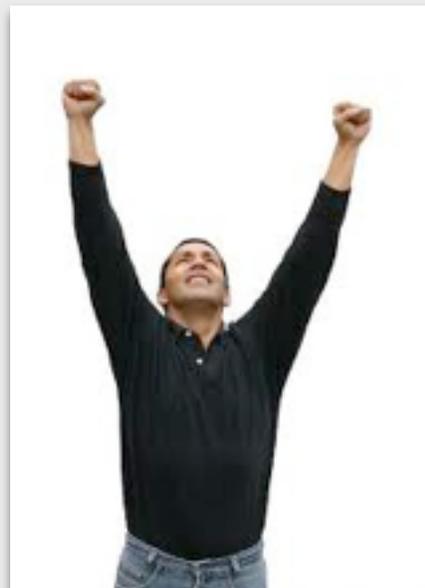
Employers can help lessen stress in workplace

Stress is stress.

Clinically speaking, the negative health effects of stress haven't changed since the condition was first diagnosed as a health problem. But the amount of stress the average person carries — and its causes — have **tremendously** since the start of the Great Recession. Its effects will become chronic conditions for millions of Americans, health experts say.

“Stress in the workplace has shifted from a focus on achieving and excelling to **just surviving**,” said Nacie Carson, director of learning and development at Cleaver International, a management and consulting firm based in Sherborn, Mass.

The burden of keeping their jobs presents a dramatic shift in the causes of workplace stress, said Alex Lickerman, a primary care physician at the University of Chicago.



The main causes of workplace stress these days are:

Job insecurity and the constant fear of being laid off;

Chronic unemployment;

Tension with colleagues, direct reports, and/or managers;

More (or less) responsibility at work;

Lack of career direction;

Lack of leadership and little to no dialogue of the company's mission;

Constant distractions from having to multi-task; and,

Higher costs of living.

Higher-ups need to better communicate with each other and subordinates.

“Communication is dismal in Corporate America,” Lickerman said. “Entry-level employees trust the messages of top-tier management and their direct supervisors. Yet when a company rolls out a new initiative, internal communication is often the last thing they think about.”

Just having real conversations with employees about the state of the company and the security of their jobs can go a long way toward better morale and employee mental health, said Carson, who urges those conversations should not take place in a group setting. “Taking the time to check in and having an **honest discussion** with individuals is key to making people feel like they are respected [and] valued.”

That may be especially true for young workers, many of whom are seeing the devastating effects of layoffs on their peers and family members for the first time in their professional lives.

In addition to communicating openly about any problems, companies can help younger or newer members of the team by providing more training. “It’s a great way to not only reduce stress, but also to reinvest in the organization,” Carson said.

Training doesn’t have to be expensive and can be as easy as one-on-one coaching and mentoring. The key is to highlight employees’ potential and encourage ongoing skill development, Carson said.

Adding humor in the workplace and developing activities that workers and their families can share — like a bowling or softball league — can also help, Mujtaba said. It encourages colleagues to talk with each other in a non-combative location and having family members there can diffuse volatile work relationships.

At the end of the day, what people really need **is support and encouragement**, Lickerman added.

“They need to hear, ‘You can do this, what you’re dealing with now is just a bump in the road,’” Lickerman said. “And often, a 15-minute pep talk is just as effective as an hours-long discussion.”

An Appetite for Life

In 1994, electrician Phillippe Croizon was hit by a 20,000-volt charge on job, requiring all four of his limbs to be amputated. Now, the Frenchman has become the first limbless person to swim the English Channel, the 21-mile expanse in just over 12 hours. “I did it! It’s mad!” said Croizon as he arrived on the shore of Wissant, France. Croizon used specially designed prosthetic flippers to make the journey. “I’ve done this for myself, for my family, and for all those who have suffered tragedy and lost their taste for life,” he said.



Must See Video of the Day

US military Jeep torn completely down and rebuilt in under **4 minutes**

I have never seen anything like this, a military Jeep torn completely down in under four minutes. This isn’t some gimmick either, they drove it to and from the exhibition. While not “tech” related, this is definitely one of the coolest things you will see all day.



http://www.hardocp.com/news/2010/09/10/must_see_video_day