

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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★An eBook dedicated to the founder of the Dirty Dozen by Charles Alday. Learning human factors from the pipeline industry

★Airlines' lessons in safety for oil industry

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★Extraverts Are More Vulnerable to Effects of Sleep Deprivation After Social Interaction

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FAA sets new rules for alert colors in flight deck displays.

The US FAA has finalized a new rule that delineates which colors can be used for warning, caution and advisory alert indications in the cockpit for new transport category aircraft to be certified after 3 January 2011. Though de facto standards are currently in place regarding the alerts generated by advanced glass cockpit avionics systems, the FAA says each manufacturer must gain approval through FAA-written issue papers and special conditions, processes that require "additional work" for the agency. Baseline regulations were issued in 1977 and "have never been amended", says the FAA in the final rule. The FAA issued the preliminary rule in July 2009.



Alert colors on the flight deck for future new aircraft will have red for warnings, amber or yellow for cautions and any color except red, amber, yellow or green for advisory alerts.

Weather, terrain or traffic displays may still use the four colors, but "must not adversely affect flightcrew alerting" says the FAA.

In addition, warning and caution alerts will require attention-getting cues through at least two different senses. The rule harmonizes the FAA's regulations on the topic with the European Aviation Safety Agency.

Overall, the FAA says it recommends that manufactures use six or fewer colors in a typical flight deck to display all of the information necessary to safely operate the aircraft.

Operationally, the FAA is requiring that alerts be designed so that after each occurrence, the pilot can acknowledge the problem and suppress the alarm.

The system itself must prevent "presentation of an inappropriate or unnecessary", or nuisance alert and automatically remove the alert when the conditions no longer exist.

The FAA estimates the rule will **avoid about 10 serious injuries over a 20-year period**, resulting in a total cost benefit of \$4.4 million over two decades. Cost to manufacturers is estimated to be a about \$0.7 million per new aircraft, the agency says.

An eBook dedicated to the founder of the Dirty Dozen by Charles Alday. Learning human factors from the pipeline industry

Charles Alday has 43 years of experience in pipeline construction, operations, maintenance, and management. He was the Operational Excellence Manager for Colonial Pipeline Company. In that role, he worked with people in all parts of the organization to eliminate pipeline spills, leaks, and errors. He has provided human factors consulting services to seven pipeline companies in the United States and China. He has a Master's degree in Business Management and Bachelor's degrees in Philosophy and Accounting.

This eBook is dedicated to Mr. Gordon Dupont of System Safety Services. he worked at Transport Canada, he developed The Dirty Dozen as a part of a human performance program to help aviation maintenance technicians **learn about the causes of errors and the human factors** involved in their work. I met Gordon in 2000 at an aviation human factors conference. I was on a quest for human factors knowledge that could be applied to the pipeline industry. Gordon is enthusiastic about safety and allowed my colleagues and me to use The Dirty Dozen. Since then, I have been teaching people in the **pipeline and nuclear industries** about these causes of errors and accidents. The twelve causes of errors and accidents apply to humans in all industries.



One eBook dirty dozen article will be featured in future issues. We start off with:

STRESS

☒ “Do not shut the pipeline down for any reason.” OR

☒ “Every employee has the authority to shut the pipeline down if he or she suspects a problem.”

Which one of those is closer to the norm for your company? Why is it that way? What other norms exist where you work?

Make a list of the expectations and rules, written and particularly unwritten, that define the acceptable and unacceptable behaviors where you work. Think about the ways people talk with one another, what they wear, what subjects are discussed at work, what is not discussed, and how people interact with one another. Then discuss whether these are good norms or bad norms. **What makes a norm good or bad?**

Let me tell you a story about the power of group norms on individuals. Individuals at a facility were reluctant to use operating procedures. Even though people were making operating errors, their norm was to rely on memory instead of referring to the procedure. I was talking with an employee who had been with the company less than four months. If anyone needed to use procedures rather than memory, it is a new employee. After I explained the requirements and the benefits of using procedures, he remarked about the procedure we were using, “We don’t do it that way here.” I laughed and asked, “Have you been here long enough to know the way it is done?” The group had already taught him the bad norm of refusing to use procedures. This illustrates how powerful a group norm can be when someone is violating a norm. If the new employee violated a norm, he would be criticized and would not receive help from group members. It’s not a laughing matter. Most people do not want to be different from others in the group. But some groups have a deviant.

Norms can be powerful in a positive way if there is a deviant who violates good norms that the group has developed for ensuring safety. When a delivery is started at a pipeline, the control valve is usually closed until the delivery block valve is opened. Then the control valve is gradually opened until the proper flow and pressure is obtained. This is the norm. One man had a practice of opening the control valve and then opening the delivery block valve. The rush of pressure could be damaging to the station equipment and cause shutdowns due to over-pressure.

After I caught him doing this one time, I admonished him and told him he would be reported to management if he ever did it again. I hope no deviants work with you!

What are ways to develop good norms that contribute to excellent performance and that ensure safe operations?

- Identify the norms that are used, lived with, tolerated, and not tolerated at work.
- Distinguish good norms from harmful norms.
- Use your influence in the group to change the harmful norms to good ones.
- When you are sure that your norms are helpful, maintain your beliefs and practices.

Just as groups need to examine their norms and make changes when necessary, individuals should do the same. Use the questions below as a self-assessment.

Do you:

- Know and follow the operations and safety philosophies, policies, and procedures?
- Set a good example for others, particularly new employees?
- Encourage others when they are using helpful norms and behaving in safe ways?
- Challenge others when they are using harmful norms and behaving in unsafe ways?
- Accentuate good practices, avoid bad practices?
- Recognize that the “way we have always done it” may not be the best way?
- Avoid shortcuts and workarounds that may cause errors and accidents?
- Know how to avoid all of The Dirty Dozen?

Airlines' lessons in safety for oil industry

The global oil industry is this year facing its biggest reputational crisis yet, following BP's catastrophic spill in the Gulf of Mexico. As a result, international oil companies have been **turning to the aviation industry for advice**. Last week, when oil industry safety officers from around the world descended on Abu Dhabi's Yas Island to attend the inaugural



international safety and competence conference of the Offshore Petroleum Industry Training Organization (OPITO), the keynote speaker addressing the packed conference room was not one of their own.

It was Capt. Chris Knowles, a consultant **to the aviation industry** throughout the Middle East.

The aviation industry in the region is the most tightly regulated in the world, said Capt Knowles, not least because of the public perception that air travel is dangerous.

A single high-profile incident that precipitates a loss of confidence in safety or security standards can bankrupt an air carrier, as happened to Pan Am after the infamous bombing of one of its passenger jets in 1988 by a Libyan terrorist group over the Scottish town of Lockerbie.

This year, some analysts predicted the Macondo oil spill would put BP out of business. That now seems unlikely, but the company **will lose its status** as the second-biggest international oil producer after it finishes selling US \$30 billion (Dh110.19bn) of assets to help pay for costs related to the spill.

The message for both industries, said Capt. Knowles, **is to avoid complacency: "The assumption that safety is 'good enough' can only lead to disaster."**

Global statistics on passenger mortality show why public confidence in airline safety is a constant issue.

Although airline public relations campaigns often state that air travel is statistically the safest mode of transport, that is only true relative to distances travelled.

In terms of numbers of passenger journeys, only bicycles and motorcycles are more dangerous than aircraft. Worldwide, a passenger is nearly three times as likely to die on any given journey by air as on a car trip.

The airline industry and its regulators have been engaged in safety research for decades, aiming for improvements in training programs and safety standards. By comparison, the international oil industry is at an early stage.

"This industry is reactive," said Gordon Ballard, the chairman of OPITO and the UK chairman of Schlumberger, the world's biggest oil services company. **"Improvements have only arisen as a result of major accidents."**

Many oil industry managers agree. So does Barack Obama, the US president, who in June described the Macondo disaster as "emblematic of a failed philosophy that regards all regulation with hostility".

One senior oil industry manager, interviewed anonymously by researchers from the Aberdeen Business School of Scotland's Robert Gordon University for an independent study commissioned by OPITO, described the problem thus: **"The biggest difficulty** you face in this industry is that while nothing is going wrong everybody is happy ... and it is only after a major incident that suddenly things start to come out."

Said another respondent: "Unfortunately a lot of training has been developed because people have been killed."

The study also revealed a **lack of internal consistency in safety standards** within large international oil firms, as well as a lack of co-operation between companies.

"They don't speak to each other. They don't share standards with each other," said an interviewee. "This is how ridiculous it is. Basically in the oil and gas companies, each individual operating unit seems to stand and fall on its own. **There is very little sharing of information."**

The aviation industry has done better on this score, and its research has recently yielded some interesting results on the causes of aircraft accidents. It transpires that lack of sleep among air crews is a bigger factor than previously suspected. **Fatigue is implicated in 30 per cent** of in-flight incidents resulting in injury or death.

Because of this, some pilots are now being asked to spend nights before their flights wired up to sleep-monitoring equipment, so that researchers can investigate their sleep patterns.

"We understand diet and exercise, but not really sleep yet," said Capt Knowles. Nevertheless, most long-haul air carriers already use double crews, and cockpits have been redesigned to include bunks.

Airlines also strive to bring their back-up crews aboard tired, so their initial flight duty is to sleep.

Judging from the lively discussion that followed the presentation, the oil industry audience was fascinated.

"Sleep is measured by duration, quantity and quality. In the oil and gas industry, with our 12 hours on, 12 hours off, shift pattern, **we miss all three,**" said one delegate. "Now we know what the problem is and we need to tackle it."

Little Things Matter

100 Ways to Improve Your Life Today

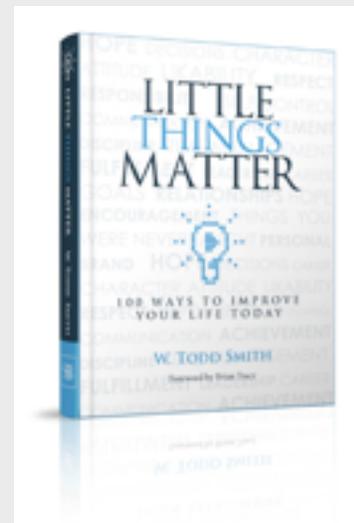
As a dynamic entrepreneur for 30 years, Todd has enjoyed professional, him in the top 1/100 of 1 percent of people in his chosen fields.

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-

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http://www.amazon.com/Little-Things-Matter-ebook/dp/B0049U47YC/ref=sr_1_1?s=books&ie=UTF8&qid=1291124290&sr=1-1

QUESTION: What percentage of fatal car crashes involve a drowsy driver?

Answer: About 16.5 percent of deadly crashes ([one in six](#)) involve a driver who is drowsy, according to the U.S. National Highway Traffic Safety (NHTSA). This percentage is substantially higher than most previous estimates, suggesting that the contribution of drowsy driving to motor vehicle crashes, injuries, and deaths has [not](#) been fully appreciated previously.



The NHTSA also reports that:

- Younger drivers age 16-24 were nearly twice as likely to be involved in a drowsy driving crash as drivers age 40-59.
- Two out of three drivers involved in drowsy driving crashes were men.
- Vehicles in which the driver was alone--unaccompanied by a passenger--were nearly 50 percent more likely to be involved in a drowsy driving related crash than those who had company on their drives.

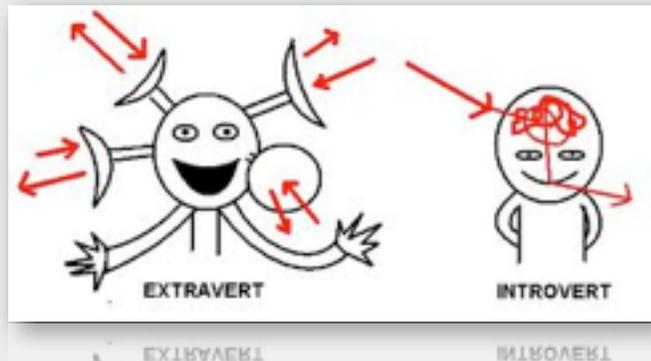
On the topic of drowsy driving, a new report from the AAA Foundation’s third annual Traffic Safety Culture Index offers its own startling findings:

- Two out of five drivers (41%) reported having “fallen asleep or nodded off” while driving at least once in their lifetime; one in ten (11%) reported having done so within the past year; and 4% said they did so in the past month.
- More than one in four drivers (27%) admitted they had driven while they were “so sleepy that [they] had a hard time keeping [their] eyes open” within the past month.
- More than half (55%) of those drivers who reported having fallen asleep while driving in the past year said that it occurred on a high-speed divided highway.

Source: AAA Foundation, “Asleep at the Wheel: The Prevalence and Impact of Drowsy Driving” November 2010. <http://www.aaafoundation.org/pdf/2010DrowsyDrivingFS.pdf>

Extraverts Are More Vulnerable to Effects of Sleep Deprivation After Social Interaction

Researchers have found that vulnerability to **sleep deprivation** is influenced by the interaction between waking social activity and individual personality traits. Results of a new study, which appears in the November 1 issue of the journal SLEEP, show that extraverts who were exposed to **12 hours of social interaction** were more vulnerable to subsequent sleep deprivation than those who were exposed to an identical period of isolated activity.



Speed on the Psychomotor Vigilance Task (PVT) for extraverts in the socially enriched group was **significantly slower at 4 AM, 6 AM, and noon** compared with speed for extraverts in the socially impoverished condition. Introverts' speed on the PVT was relatively unaffected by prior social exposure.

"Extraverts exposed to socially enriched environments showed greater vulnerability to subsequent sleep deprivation than did extraverts exposed to an identical but socially impoverished environment," said principal investigator and lead author Tracy L. Rupp, PhD, research psychologist in the Behavioral Biology Branch of the Center for Military Psychiatry and Neuroscience at Walter Reed Army Institute of Research in Silver Spring, Md. "The ability of introverts to resist sleep loss was relatively unaffected by the social environment. Overall, the present results might also be interpreted more generally to suggest that waking experiences, along with their interaction with individual characteristics, influence vulnerability to subsequent sleep loss."

According to the authors, social interactions are cognitively complex experiences that **may lead to rapid fatigue in brain regions that regulate attention and alertness**. Therefore, high levels of social stimulation may be associated with an increase in the need for sleep. However, some individuals have a trait-like resistance to sleep loss that appears to be rooted in genetic differences. In particular, introverts may have higher levels of cortical arousal, giving them greater resistance to sleep deprivation.

Rupp noted that the results may have implications for industries that require workers to maintain alertness during **periods of sustained wakefulness**. Potential performance consequences resulting from team assignments or independent work may vary depending on an individual's personality traits.

Black Sprinters' Navel Advantage

To size up a sprinter's potential speed, start by examining his/her navel. That's the conclusion of researchers at Duke University, who dared to the historically verboten question; **Why do Africans and African-Americans tend to run faster than whites?** The answer, says Science Daily, lies with the bellybutton, which makes the body's center of gravity. An analysis of prior studies of human measurements revealed that, on average, people of West African origin have **longer legs** than people with European heritage; the longer legs, and shorter torsos, place their center of gravity 3 percent, or roughly **an inch, higher**.



Collating a century's worth of sprinting records revealed that this height difference translates into a 1.5 percent boost in speed-enough to make a big difference in the results of **sprinters**, in which fractions of a second separate winners from losers. "Locomotion is essentially a continual process of falling forward, and mass that falls from a higher altitude falls faster," says research leader Andre Bejan. The converse **holds true for swimmers**: Europeans have a 3 percent longer torso than West Africans, which equals a 1.5 percent speed advantage in the pool. The researchers were careful to note that they focused on the athletes' geographic **origins and physical measurements**, not race, which they deem a 'social construct.'