

Aviation Human Factors Industry News

Volume VII. Issue 21, June 10, 2011



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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★The Fixation Factor

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★FAASTeam Maintenance Safety Tip

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How Alarming are Airport Ramp Accidents?

If there's one thing you can count on in aviation it is that every aspect of it is a lot more complicated than you think. In a recent post on ramp accidents, a Flight Safety Foundation report which gave some pretty alarming numbers.

In the May 2007 issue of *Aerosafety World*, the Flight Safety magazine used numbers from the International Air Transport Association to estimate that there were **twenty-seven thousand ramp accidents each year** in which **240,000 people were injured**.

A number of readers thought the numbers, which have appeared in other aviation magazines since the article was published were just too high.



No one quibbles with the statement that ramp accidents are tremendously expensive, after all, it doesn't take too many dings in a \$100 million airplane to start running up a serious repair tab. But a quarter of a million injuries? This just can't be. IATA, the source of the original numbers, is arguing with the FSS report.

Anthony Concil, spokesman for IATA said, "**ramp fatalities are anecdotally five to ten per year.**" He suggested that the quarter of a million injuries cited by FSS are on-the-job injuries, not atypical in any industry that deals with machines and moving vehicles. "To connect the number of on-the-job injury reports to ramp accidents misrepresents actual events."

Curiously, while Jay Donoghue of the Flight Safety Foundation's office of publications admits there was some discussion over "the disparity in numbers", a week of exchanging emails with the Foundation yields no further explanation. The Air Transport Association tracks ground-based events, but the numbers are not shared outside of the association.

So what do we know? Well, in the United States, when serious injuries or substantial damage are involved, a report must be filed with the Federal Aviation Administration. Bob Matthews - attendant of these statistics at the FAA - says that [from 1996 to 2010 there were 46 fatal or serious injuries during ground operations at U.S. airports](#). And while the U.S. is a busy aviation market, it represents just a fraction of commercial aviation worldwide.

The U.S. had a fatality-free year in 2009 and 2010, Matthews said. In other countries [it is a different story](#). At one unidentified airport in India earlier this year, a worker's hand was trapped in an retracting jetbridge and while the employee was rushed to medical care, she did not survive. At an Asian airport, a ramp worker was crushed under the wheels of a power supply vehicle.

Ramp workers have been sucked into airplane engines, crushed in scissor lifts and hit by tugs. Five of the people on board this Etihad Airways A340 were injured when the airplane crashed through a containment wall during ground tests. A factor in the loss of the airplane? Wheels not chocked during engine and brake system testing.

[From simple mistakes do great losses originate.](#)

Whether the emphasis on the collision between an Airbus A380 and a Bombardier CRJ 700 is due to the fact that it was video taped and uploaded to You Tube, or an appropriate reaction to the latest illustration of something larger, there should be no argument that it is imperative that the industry get a handle on the size of the problem.

That the assessment of two respected aviation institutions can vary so widely tells us that the effort to quantify the issue is long overdue. Last month, IATA began the first worldwide effort to gather meaningful statistics. Overstating the problem is no better than understating it.

"Ground damage is a big issue but these statistics need to be related to their source,"

<http://christinenegroni.blogspot.com/2011/04/how-alarming-are-airport-ramp-accidents.html>

THE FI*ATION FACTOR

The ability to maintain the “big picture” while completing individual, discrete tasks is one of the **most critical aspects** of working in the aviation environment. Preoccupation with one particular task can degrade the ability to detect other important information.

This month’s **CALLBACK** looks at examples of how fixation adversely affects overall task management.



A Repack Comes Back

By fixating on one aspect of a multi-part job, this Maintenance Technician **missed a key factor** in re-assembling a B767 landing gear.

■ I was assigned the task of a B767 main landing gear repack.... I removed the lower truck assembly, removed all parts and began assembly.... I assembled the lower gland nut, lower seal carrier, spacer, snubber and upper bearing.

The upper bearing can be assembled about five different ways. **It is not “Murphy-proof.”** The Aircraft Maintenance Manual says to check for proper orientation and this is where **I made the mistake**. I was fixated on the orientation (installed either upside down or right side up) and not the proper placement of the upper bearing. I continued on and finished the repack and I signed the paperwork off.

Enroute to destination, the crew discovered the right-hand main landing gear **would not come out** of the wheel well. They declared an emergency and through extreme maneuvers were able to free the gear and land safely.

I was called out to fly to the aircraft location to perform another strut repack and found **we** had assembled the upper bearing incorrectly.... The strut over-extended by 7/8 inch and got caught in the wheel well.

FAA Expresses Concern over Technician Fatigue

The most recent FAA FAAS Team Maintenance Safety Tip conveys the FAA's growing concern about fatigue, in this case [technician fatigue](#). The issue has long been associated with pilots but rarely with technicians.

FAR Part 121.377–Maintenance and preventive maintenance personnel duty–states: “Within the United States each certificate holder (or person performing maintenance or preventive maintenance functions for it) shall relieve each person performing maintenance or preventive maintenance from duty for a period of [at least 24 consecutive hours during any seven consecutive days or the equivalent thereof within any one calendar month.](#)”



The Maintenance Safety Tip points out, “Although aviation maintenance personnel typically work long hours, often nights and weekends, [they are rarely included](#) in aviation industry programs to fight fatigue (physical and mental).

Duty time limits and other efforts to address fatigue typically are intended for flight crews—not maintenance personnel. Even the reference (121.377) only applies to Part 121 functions.

“Since there are little or no regulatory requirements to limit work hours, especially in general aviation, the onus is on each one of us [as maintenance professionals](#) to prevent fatigue from occurring, thereby preventing maintenance errors from occurring,” it says. To that end the FAA is offering an online course titled, “[Fatigue Countermeasure Training.](#)” which addresses fatigue issues for mechanics and other maintenance technicians.

Richard Komarniski, president of Grey Owl Aviation Consultants, told AIN, “We have witnessed the effects of fatigue by our peers in the hangar and cockpit and it basically boils down to lack of professionalism. As professionals in our industry we all must be aware of the symptoms of fatigue and [take appropriate countermeasures.](#)”

“Would you bet on a race horse that was run hard, deprived of necessary rest, drank bad water, was fed old and moldy hay and did not have a good daily exercise routine?”

While we would go to great lengths to make sure animals or pets that depend on us are well rested, eat a proper diet and receive regular exercise, what do we do for ourselves?”

Komarniski, a licensed aircraft maintenance technician since 1974, [offers human factors, fatigue risk management system and safety management systems training to the aviation industry.](#)

He said fatigue is the body’s normal reaction to a physical or mental stress of prolonged duration. “The onset of fatigue is insidious and the symptoms may not be recognized until the person has reached a high degree of fatigue. It is one of the [main contributors to maintenance errors](#) and must be addressed if we are to improve safety and reduce maintenance errors,” he said.

According to Komarniski, major stresses that can provoke fatigue include insomnia, sleep apnea, family problems, financial difficulties, bad interpersonal relations, company conflicts and pressure from an employer.

“You need to be aware of these stress factors and keep them in perspective. Fatigue can affect our coordination and judgment in many ways that degrade the quality of our work. Classic case studies of maintenance errors due to fatigue include the Chernobyl and Three Mile Island nuclear plant disasters, the Boeing 737 forward fuselage section separation attributed to undetected corrosion, and the BAC 111 windshield which blew out because of the wrong size of fasteners,” he said

“The maintenance errors that contributed to these incidents all took place in the [early morning](#), when individual fatigue level is highest due to our naturally occurring daily body cycle, also known as circadian rhythms.”

Common symptoms of fatigue: reduced attention, including the reduction of visual scanning and performance; becoming less aware of performance; reverting to “old” habits; increased irritability; and development of a “don’t care” attitude.

<http://www.faasafety.gov/gslac/ALC/CourseLanding.aspx?cID=174>

<http://www.greyowl.com/hf/index.html>

FAA Team Maintenance Safety Tip

May 2011

Working to Your Limit

14 CFR Part 121.377 -- Maintenance and preventive maintenance personnel duty time limitations, says:

Within the United States, each certificate holder (or person performing maintenance or preventive maintenance functions for it) shall relieve each person performing maintenance or preventive maintenance from duty for a period of at least 24 consecutive hours during any seven consecutive days, or the equivalent thereof within any one calendar month.

Although aviation maintenance personnel typically work long hours, often nights and weekends, they are rarely included in aviation industry programs to fight fatigue (physical and mental). Duty time limits and other efforts to address fatigue typically are intended for flight crews - not maintenance personnel. Even the reference above only applies to Part 121 functions.

The International Civil Aviation Organization (ICAO) and other Civil Aviation Authorities worldwide recognize the adverse effects of tiredness and fatigue. Some operators and regulatory authorities favor a [fatigue risk management system](#).

Since there are little or no regulatory requirements to limit work hours, especially in [general aviation](#), the ownership is on each one of us as maintenance professionals to prevent fatigue from occurring, thereby preventing maintenance errors from occurring.

How do you manage the risk of fatigue-induced errors? [The following suggestions may be helpful:](#)

1. Limit overtime
2. Limit working for other employers (moon-lighting)
3. Conduct a proper handoff when changing shifts
4. Ensure you receive proper rest hours before and after work
5. Be conscious of health issues
6. Be conscious of personal issues
7. Be aware of the effects of alcohol on work performance

We also invite you to enroll in and complete the online course at www.FAASafety.gov titled, "Fatigue Countermeasure Training" which addresses fatigue issues for mechanics and other maintenance technicians.

Consumer Reports raises concerns about outsourced airline maintenance

Safer skies

Airplane maintenance must be more closely monitored, Consumers Union believes.

In its June Issue, [Consumer Reports](#) sounds a warning about the practice of U.S. airlines sending their maintenance work to third-party companies. Among the comments in its editorial:



Consumer Reports first questioned FAA oversight of outsourced repair facilities in our March 2007 issue. Then industry insiders, including front-line government safety inspectors, started telling us that budget cuts were possibly eroding the FAA's ability to adequately monitor repair facilities.

Among the worries: a lack of compliance at repair facilities, mechanics who are unlicensed, substandard security procedures, and failure to conduct pre-employment drug tests.

And

Despite an unprecedented safe era in U.S. aviation, this is no time to relax. As we went to press, some leaders in the [U.S. House of Representatives](#) were calling for budget cuts at the FAA and proposing a laissez-faire "risk-based" approach that calls for the FAA administrator to inspect foreign repair stations where "identified risks" warrant inspection.

But how will inspectors know about identified risks if they don't regularly visit those facilities? We'll be watching this issue closely.

Its editorial cited [Federal Aviation Administration](#) statistics that indicated that the FAA was overseeing 4,858 certificated repair stations, including 731 outside the United States. Airlines spent 64 percent of their maintenance budget on outsourced work in 2008, the magazine said.

<http://www.consumerreports.org/cro/magazine-archive/2011/june/viewpoint/overview/index.htm>

25 Signs You Might Be a Safety Geek

You might be a Safety Geek if: Your heart beats noticeably faster when you hear or read the word “audit”. Did it happen just then?

1. You’ll stand proudly on a deserted downtown street corner in the rain, waiting for the “Walk” signal. Every casual jacket in your closet has a “safety award” patch on it.
2. You know that the term “[Near Miss](#)” really means Near HIT.
3. Your prescription eye glasses have side shields permanently attached and you wear them EVERYWHERE because “you never know when you’re going to run into an eye injury hazard”.
4. You have a dog-eared copy of the local Occupational Safety legislation in your bathroom and almost every third section is HIGHLIGHTED.
5. You think it’s hilarious when you respond to a worker’s question about how much they can safely lift by chuckling “I don’t know how much CAN you lift?” Extra points if you slap your knee as you say this.
6. You can actually recite, from memory, the Occupational Health & Safety rules for [confined space entry](#) and [fall protection](#).
7. Whenever you hear that a fellow Safety Geek’s company has a lower [lost time injury rate](#) than yours, you immediately suspect that they are just better at their modified duty program.
8. Your favorite baseball caps have “Think Safety” boldly displayed on the front of them.
9. You know that TRIF means “Total Recordable Injury Frequency” and you can actually explain the mathematics used to calculate that number.



10. Your mouse pad has a built-in ergo wrist rest and you sit at your computer on an ergonomically designed plastic inflatable ball.
11. “N-Nitrosodimethylamine” has been added to your spell-check dictionary.
12. When watching an episode of CSI, you have a pen and paper handy so you can write down any new [investigation methods](#) you see.
13. You’ve installed a pull-down projector screen in your house so you can hold [off-the-job safety training](#) sessions for your family.
14. You have ordered “safety slogan” travel mugs for safe driving awards, even though you know that [eating and drinking while driving](#) is the number one distraction among drivers.
15. Your children won’t bring their friends over to your house to play because you make them all wear hearing protection, safety glasses and knee pads.
16. You can accurately mouth the words along with the company [Safety Orientation](#) DVD as it plays.
17. You can list every type of respirator cartridge made by name, manufacturer, number and color coding.
18. You know what: JSA, [MSDS](#), SCBA, NIOSH, OSHA, CDC, LTA and WCB all stand for, but when one of your workers calls out “BS” during your safety talk, you’re confused.
19. You know that not all “hygienists” clean people’s teeth.
20. You know at least one person who is a [certified industrial/occupational hygienist](#), you just never understand what they are saying.
21. You have what you think is a great answer to a worker’s question about why s/he has to wear a hard hat while working alone in an open field.
22. You have a presentation slide that quotes Heinrich’s “Ten Axioms of Industrial Safety”.
23. You also have a slide with a picture of an iceberg on it that has nothing to do with the sinking of the Titanic.

Conclusion

And finally (for now), you might be a Safety Geek if you care enough about your fellow humans to actually do at least some of these things noted above.

Publisher's Sign-off: SMS and Your Organization

On June 8 at 1 p.m. Central Time, AMT will be hosting a live webinar [on SMS](#) moderated by Technical Editor, Ronald Donner. Ron will be joined by two guest speakers: Robert Baron and Jerry Allen. Safety management systems are a hot topic in the industry and should be on the minds of many maintenance professionals soon, if not already. AMT has recently participated in SMS related sessions at many key industry events including the Cygnus Aviation Expo, Heli-Expo, Aircraft Electronics Association, and the NBAA Maintenance Managers Conference.



There are many questions about the meaning and exact definition of 'SMS' today. Hopefully everyone got a chance to read last month's AMT online article by Barry Ballenger titled "[From The FAA: SMS: What Does It Mean for the AMT?](#)" and Majella McDonald's Management Matters article "[What's in Your Toolbox?](#)" If you haven't gotten a chance to read them, Google them and then be sure to visit <http://amtonline.com/webinars/> to sign up to view our next webinar (yes, for FREE!) on Safety Management Systems and Your Organization.

Once you're signed up, we'll be sure to send you a reminder before the event and in case you miss the live webinar we'll send you a link to view the archived version later, at a time of your convenience. I'd like to thank the guest speakers and sponsors for making these webinars possible; stay tuned for more great information!