

Aviation MX HUMAN FACTORS

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*Written by maintenance human factors professionals dedicated to identifying and optimizing the factors that affect human performance in maintenance and inspection.
Past newsletters @ MXFatigue.com*



MAINTENANCE FATIGUE IS ON THE RADAR

BY
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***About the Author:** Bill Johnson is the Chief Scientific Technical Advisor for Human Factors in Maintenance Systems for the FAA. He is a pilot and an aviation maintenance technician.*

It is with a refreshed spirit that we publish the first newsletter of 2013. Although the new newsletter will address all maintenance human factors issues, a number of recent events have brought global attention to maintenance fatigue.

- ✦ The FAA rescinds their latest interpretation of maintenance and preventive maintenance duty time limitations, CFR 121.377, based on industry and public input. ([Office of Chief Counsel, FAA Letter](#))
- ✦ The NTSB recommends the FAA establish specific duty time rules for maintenance personnel. ([NTSB recommendation](#))
- ✦ The European Aviation Safety Agency (EASA) issues a Notice of Proposed Amendment 2013-01) to certification standards and oversight requirements for Safety Management Systems (SMS). It applies to maintenance organizations and will affect over 1,400 EASA Part 145 Repair Stations in the US. ([Notice](#))
- ✦ The FAA approves maintenance fatigue human factors research program for 2013-2015. The program focus includes providing evidence-based guidelines for a fatigue risk management system, improving the usability and acceptability of fatigue self-assessment and reporting tools, and developing ways to measure fatigue that minimize text entries.

The importance of fatigue risk management, at

work and home, is undeniable—none of us is immune. However, organizational efforts to manage fatigue risk in the workplace lag behind personal commitment to lifestyle changes. Many of you may volunteer or be expected to work overtime or double shifts without appropriate fatigue countermeasures in place. We owe it to ourselves, our co-workers, and the flying public to identify economical and practical methods to mitigate fatigue risks. You can check out a number of free resources on fatigue risk management at mxfatigue.com.

Be safety-minded! Strive for 100% compliance with technical documentation requirements and regulations on the job. Use countermeasures at work and home. Use existing systems to report all instances where fatigue risk may have compromised your safety, other's safety, task performance, and equipment.



Fatigue Countermeasures Training available at
MXFatigue.com—<https://hfskyway.faa.gov/HFSkyway/FatigueCBT.aspx>



GROUPNESS GONE BAD

BY _____
**ROGER
HUGHES**

About the author: Roger Hughes is a Human Factors Educator and the writer, editor, and distributor of the Aviation Human Factors Industry News. He is Founder of Decoding Human Factors, Inc. and a former jetBlue Airways Human Factors Manager.

Have you ever had the experience where you and those you work with are so close that you're considered a 'tight knit' group or there's that unspoken agreement that you have each other's back? Organizations typically encourage that level of cohesiveness in the workforce and may even send employees to developmental events to strengthen groupness. Not often, but at times, groupness gets in the way of making good safety decisions and doing the right thing the right way.

You may recollect a few times when safety procedures or regulations weren't followed because long duty hours and fatigue had set in—the fatigue experience literally blurs the line between truly safe and lucky. Just because someone got away with it doesn't mean you will. Just because an accepted shortcut worked in the past without incident/accident, doesn't make it a best or even a good practice.

Whenever there's a safety risk, it's important to be aware of the power of groupness, to seek accurate information from within and outside the group, and to make sure that you don't fail to follow a procedure and/or safety regulation. Sometimes what seems safe, is just a close call.

GROUPNESS GONE BAD



NASA has lost two space shuttles, costing the lives of 14 crewmembers. Was groupness at least partly to blame? Some say "yes," based on these precipitating events. The astounding effort and success of the Apollo program had led to NASA defining itself as technically excellent – 'the perfect place,' as one researcher called it. It's hard to argue with success—they had put a man on the moon. The result of their hubris was something along the lines of "you can't tell me anything I don't already know. By the time O-rings failed in the space shuttle Challenger, it was too late for NASA to avoid the impending disaster. The official report on the Columbia disaster stated, "External criticism and doubt reinforced the will to impose the party line vision on the environment, not to reconsider it..." This in turn led to in-group bias which may have contributed to flawed decision making. . .

<http://kevinhoffberg.com/blog/2010/03/13/the-perils-of-groupness/>

Groupness Gone Good



Wildland firefighting is not an individual activity, but a group one. Safety is a collective accomplishment that is socially defined through the workgroup's appropriate and normative safety actions. A series of field studies showed the importance of communication in shaping task performance and a culture of safety. The Forest Service illustrated how patterns of interactions set a group expectation for appropriate behavior. These expectations influenced members' compliance with safety policy. In particular, communication-based activities in the firefighting teams helped members to feel less pressure to take risks.

http://www.fs.fed.us/rm/pubs_other/rmrs_2012_jahn_j001.pdf

THE HUMAN HAZARD IN AVIATION MAINTENANCE

BY
JIM R. HEIN

About the author: Jim Hein is an Aviation Safety Inspector currently assigned as FAASafety Team Program Manager in Las Vegas. He has been a safety subject expert at many national and international venues and has been involved in several FAA Human Factors and Safety Management Systems projects. He is a pilot and Airframe and Powerplant Mechanic.

The FAASafety Team has added *A Human Factors Primer for Aviation Mechanics* (Course No. ALC-258) to their AMT course catalog (go to www.faasafety.gov). The new course focuses on detection and avoidance of “intentional” actions that produce “unintended” errors during maintenance tasks. Imagine being equipped to guard yourself against errors from failing to follow procedures.

The course is designed to engage the learner through interactivity and opportunities to apply new knowledge. The course objectives are to instill basic concepts and definitions associated with human factors, like the Dirty Dozen and the PEAR (People, Environment, Actions, Resources) model; provide a historical review of human factors; bring awareness to the fact that there are multiple research, science, and applied

disciplines jointly working to expand what we know about human factors in aviation maintenance; and define human error by presenting differences between unintentional and intentional errors, with an emphasis on violations.

It is empowering to know how you can make a difference. Set an hour aside and immerse yourself in *A Human Factors Primer for Aviation Mechanics*. It is free and some say it is fun.

There are bonuses to completing the course. It is a 2013 core requirement for the FAA AMT AWARD program. Airframe & Powerplant mechanics who hold an Inspection Authorization (IA) will receive one hour credit toward their IA renewal in accordance with 14 CFR 65.93(a)(4).

The online course is based on the latest version of the AMT General Handbook FAA-H-8083-30, Chapter 14. It contains video of the human factors series starring Dr. Bill Johnson and his cohort Dagmar. It covers some safety culture ideas gleaned from the Safety Management System arena.

It also presents information from Reason's and Hobbs' book titled *Managing Maintenance Error*.



A zero violations poster is made available for downloading and printing with suggested places to distribute and display it.



Aviation Maintenance Safety Tips by Phil Randall

About the Author: Phil Randall is the Assistant National FAASafety Team (FAA Safety Team) Manager and also serves as the FAASafety Team National Airworthiness Group Lead. He has received three national FAA Visionary Awards for his work in promoting safety in our industry utilizing various formats.



For a number of years the FAA's Safety Team (FAASafety Team) has sent "Maintenance Safety Tips" to Aviation Maintenance Technicians (AMTs) who are registered on FAASafety.gov. Now the tips will also be published in the quarterly issues of this newsletter. This issue's Safety Tips from the FAASafety Team address how to counter fatigue.

A portion of the increase in accidents and violations is due to human fatigue. The adverse effects of tiredness and fatigue have been acknowledged by the International Civil Aviation Organization (ICAO) and other Civil Aviation Authorities worldwide, yet aviation maintenance personnel are rarely included in aviation industry programs to counter fatigue (physical and mental). Even with a history of maintenance personnel working long hours, often including nights and weekends, duty time limits and other efforts to mitigate fatigue risk have mainly focused on flight crews.

The current rule for maintenance and preventive maintenance personnel duty time limitations (14 CFR Part 121.377) only applies to Part 121 functions.

14 CFR Part 121.377

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.

Since there are little or no regulatory requirements to limit work hours, especially in general aviation, the responsibility is on the maintenance organizations and each one of us as maintenance professionals to prevent fatigue from impacting work performance and maintenance errors. Here are some helpful tips to counter fatigue risk on the job:

At home:

- ✦ Ensure you get sufficient quality rest on duty days and off days
- ✦ Take care of yourself--improve your wellness and seek treatment for health issues
- ✦ Know that alcohol negatively effects sleep quality
- ✦ Be conscious of personal issues that are effecting your sleep and safety

At work:

- ✦ Conduct a proper handoff when changing shifts
- ✦ Place a limit on the daily length and weekly amount of overtime worked
- ✦ Restrict the number of hours working elsewhere, i.e., moon-lighting

A final tip, if you haven't yet had a chance, be sure to get online and complete the "Fatigue Countermeasure Training" at <http://www.faasafety.gov/>. The course is tailored to mechanics and other maintenance technicians. Many who have completed it have also had family members and friends go through the training—it is that powerful!

Look for upcoming newsletter issues for more FAASafety tips that might ensure you, the AMT or aircraft owner/operator, do not cause an accident by falling prey to the dreadful Dirty Dozen!

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HUMAN FACTORS



About the Maintenance Human Factors Newsletter:

The Maintenance Human Factors Newsletter began several years ago as the "MX Fatigue Focus Newsletter". The newsletter included information on fatigue and fatigue risk management. It was written for aviation maintenance technicians and their managers in Plain English. The newsletter covered stories on scientific studies, federal regulations, and industry successes. In many cases the short articles were written by technicians, managers, students, and professors, among others. It was not necessarily a scientific publication.

This newsletter is intended to be an extension of that early work with an expanded focus to human factors issues across aviation maintenance.

If you have a story to tell that will help enhance aviation safety, please email katrina.avers@faa.gov or bill-dr.johnson@faa.gov. The editorial staff will help writers with layout and graphics.

If you would like to be added to our quarterly distribution list, please email joy.banks@faa.gov