

Aviation Human Factors Industry News

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Hello all,

In this weeks edition of *Aviation Human Factors Industry News* you will read the following stories:

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★**PAMA Supports FAA Efforts to Re-Test Mechanics**

★**Light Plane Maintenance**

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News Station's Aircraft Mechanics Probe

"There is evidence of repair facilities hiring low-wage mechanics **who can't read**," alleges Dallas/Fort Worth-area news station WFAA. The station has the way the FAA licenses aircraft mechanics and believes it has found "evidence of years of problems **in testing** these mechanics" and evidence that "hundreds of mechanics" are working with "questionable licenses" in Texas and elsewhere. While previously citing improperly regulated testing at St. George Aviation Testing Center in Florida in 1999, the latest assertions stem from the station's conclusion that "hundreds of the mechanics" working at 236 FAA-certified aircraft repair stations in Texas **do not speak English** and **therefore can't read aircraft repair manuals**. And while "one certified A&P can sign off on the work of dozens of uncertified mechanics," says WFAA, **"there is a push to get work out the door."** WFAA's recent article on the topic goes on to cite a fatal commuter plane crash (that it does not connect with foreign-language mechanics, but with **improper oversight** of the repair process); difficulties with foreign pilot licensing; and a licensing center in San Antonio (since closed by the FAA) where, it alleges, **mechanics were being tested in Spanish**. Certified mechanics quoted in the article note the challenges of working with their foreign-speaking non-certified counterparts.



While noting that repairs performed by any person at a repair facility must ultimately be signed off by a certified A&P mechanic who then takes responsibility for the repair, WFAA found one mechanic who anonymously explained his (or her) difficulty. "I need an interpreter to talk to these people," he (or she) said. **"They can't read the manuals, they can't write, and I have so many working for me I can't be sure of the work they've done."** WFAA appears to suggest that **time and schedule pressures** that come as a byproduct of working with commercial aircraft can prevent certified mechanics from properly overseeing work performed by dozens of untrained assisting mechanics who can't read the manuals or write down what they've done -- and that **not all certified mechanics have experienced proper training**.

PAMA Supports FAA Efforts to Re-Test Mechanics



After reports of FAA investigation of A&P testing centers in Texas and the subsequent claims that as many as **1300 mechanics may have been "improperly" certified** over the course of well over a decade, the Aviation Maintenance Association is stepping up to face the matter head-on. The FAA reports that some of the mechanics have been retested, but, because the mechanics are now dispersed around the world, retesting progress has been slowed. PAMA has gone on the record as supporting and commending the FAA's attempts to correct this issue.

"PAMA strongly endorses the comprehensive, quality education as prescribed by the FAA for students entering the field, and we are dedicated to helping the FAA improve and modernize the system. We believe the work of an improperly trained and certified A&P mechanic not only reflects negatively upon all maintenance professionals but presents an inherent danger to the purpose of our industry - **the safety of flight**. We work closely with the FAA to ensure that PAMA continuing education programming meets industry needs and Administration standards. Also, to enhance an A&P candidate's education, PAMA extends its membership benefits to PART 147 students and encourages their involvement in PAMA chapter activities, as well as national events. To us, quality continuing education is just as important as the quality of initial A&P training."

PAMA adds that, "While we support and commend the FAA's attempts to correct the problem in Texas, we also encourage the Administration to recognize that the individuals going through these programs may not have understood they were not getting proper training. These individuals no doubt entered the industry placing their trust in a training institution to prepare them properly. **We do not believe** that these individuals should be working in the industry with their current training, but we do applaud the Administration for providing a mechanism for these unsuspecting individuals to come into compliance with Federal Aviation Regulations."



This newsletter is for aircraft owners and pilots looking for **practical maintenance advice**.

Every issue of **Light Plane Maintenance** is packed with valuable information such as:

- * Concise, step-by-step inspection and repair instructions.
- * A monthly editorial advice column for your airplane called Field Notes.
- * A Service Hotline section listing known issues with various airplane models.
- * A section dedicated to letters from our avid readers.
- * A monthly Q&A section for subscribers to get answers to their questions!
- * And much, much, more!

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Big Clue: Maintenance Placard



In this month's **CALLBACK**, we'll sample a selection of ASRS incident reports that describe how some pilots and air crews missed – or heeded – important clues to flight safety. Our selection includes general aviation, air carrier, and **maintenance incidents**.

An air carrier
Maintenance
Technician raised
safety concerns
about flight and
cabin crews who
ignore

“inoperative” placards – big clues – on aircraft items.



indication of report narrative Myself and AMT [Aviation Maintenance Technician] #2 placarded the First Class oven inoperative for a broken operating handle. Per the galley item and safety of the aircraft, we opened and collared the circuit breaker and locked the oven in the closed position and applied ‘Inoperative’ stickers. The following day...we were accomplishing the interior inspection per the ETOPS [Extended-range Twin-engine Operational Performance Standards] program and found ovens were in operating condition, but with the “Inop” placards torn off, oven hot, circuit breaker closed, and broken handle thrown on top of galley cabinet.

Retrain Flight Attendants to not ignore placards for safety reasons. Flight crew ignored warnings, bypassed deferral and [reset] circuit breaker to operate oven.

This reporter further stated that when unauthorized personnel reset circuit breakers, overheating and possible electrical fires can result.

Stay Well to Do Your Job Well

It's pretty hard to do your job well if you are at home sick in bed. Doing your best to stay healthy is an important part of producing good quality.

1. Eat regular, nutritious meals. Start your day with a good breakfast such as fruit and whole-grain cereal or toast.
2. Throughout the day, eat a variety of fresh vegetables, fruits, bean dishes and whole grains such as rice and



pasta. Every day have some citrus fruit or another food high in vitamin C. Get a variety of vitamins in your diet by choosing fruits and vegetables of different types, colors and textures.

3. **Drink plenty of water**, especially in hot weather or dry environments.
4. You need some **type of activity** which will raise your heart rate for at least 20 minutes, several times a week. A brisk walk or bike ride would accomplish this. Swimming, dancing, hiking and aerobics are also activities to improve the capacity of your heart and lungs.
5. You need to keep your **muscles strong**. Aerobic routines, certain sports and weight training can all contribute to muscle strength.
6. You also **need exercise** which keeps your muscles and ligaments flexible. Yoga routines and stretching exercises before and after a workout are examples.
7. **Get enough sleep**. Adequate sleep is needed to keep your body's immune system in good working order.
8. **Learn to handle stress**.
9. **Have regular medical and dental checkups**. Follow the advice of health professionals. Take your doctor's advice for treating high blood pressure, a common cause of heart attacks.
10. **Don't smoke**. Quitting can add years of good health to your life.

Sleep Drive and Your Body Clock

Most people notice that they naturally experience different levels of sleepiness and alertness throughout the day, **but what causes these patterns?** Sleep is regulated by two body systems: **sleep/wake** and the **circadian biological clock**.

When we have been awake for a long period of time, **sleep/wake**



homeostasis tells us that a need for sleep is accumulating and that it is time to sleep. It also helps us maintain enough sleep throughout the night to make up for the hours of being awake. If this restorative process existed alone, it would mean that we would be most alert as our day was starting out, and that the longer we were awake, the more we would feel like sleeping. In this way, **sleep/wake homeostasis** creates a drive that balances sleep and wakefulness.

Our **internal circadian biological clocks**, on the other hand, regulate the timing of periods of sleepiness and wakefulness throughout the day. The **circadian rhythm** dips and rises at different times of the day, so adults' strongest sleep drive generally occurs between **2:00-4:00 am** and in the afternoon between 1:00-3:00 p.m., although there is some variation depending on whether you are a “morning person” or “evening person.” The sleepiness we experience during these circadian dips will be less intense if we have had sufficient sleep, and more intense when we are sleep deprived. The **circadian rhythm** also causes us to feel more alert at certain points of the day, even if we have been awake for hours and our sleep/wake restorative process would otherwise make us feel more sleepy.

Changes to this **circadian rhythm** occur during adolescence, when most teens experience a sleep phase delay. This shift in teens' **circadian rhythm** causes them to naturally feel alert later at night, making it difficult for them to fall asleep before 11:00 p.m.. Since most teens wake up early for school and other commitments, this sleep phase delay can make it difficult to get the sleep teens need -- an average of 9 1/4 hours, but at least 8 1/2 hours. This sleep deprivation can influence the **circadian rhythm**; for teens the strongest circadian “dips” tend to occur between 3:00-7:00 am and 2:00-5:00 p.m., but the morning dip (3:00-7:00 am) can be even longer if teens haven't had enough sleep, and can even last until 9:00 or 10:00 am.

The **circadian biological clock** is controlled by a part of the brain called the **Suprachiasmatic Nucleus (SCN)**, a group of cells in the hypothalamus that respond to light and dark signals. From the optic nerve of the eye, light travels to the SCN, signaling the internal clock that it is time to be awake. The SCN signals to other parts of the brain that control hormones, body temperature and other functions that play a role in making us feel sleepy or awake.

In the mornings, with exposure to light, the **SCN** sends signals to raise body temperature and produce hormones like cortisol. The **SCN** also responds to light by delaying the release of other hormones like melatonin, which is associated with sleep onset and is produced when the eyes signal to the **SCN** that it is dark. Melatonin levels rise in the evening and stay

elevated throughout the night, promoting sleep.

In teenagers, research has shown that **melatonin levels** in the blood naturally rise later at night than in most children and adults. Since teens may have difficulty going to bed early to get enough sleep, it can help to keep the lights dim at night as bedtime approaches. It can also help to get into bright light as soon as possible in the morning.

Circadian disruptions such as jet lag put us in conflict with our natural sleep patterns, since the shift in time and light cues on the brain forces the body to alter its normal pattern to adjust. This is why jet lag can leave travelers feeling poorly and having more difficulty thinking and performing well. But these symptoms can also occur in everyday life, when the circadian rhythm is disrupted by keeping long and irregular hours. Because of this, it is important to keep a regular sleep schedule and allow plenty of time for quality sleep, allowing these two vital biological components -- the sleep/wake restorative process and the **circadian rhythm** -- to help us perform at our best.

Build a Winning Mind – Part II

Research on mindset and performance

[Here are just 3 studies.](#)

1. People's brainwaves were monitored as they answered difficult questions and awaited feedback. Those with a limited mindset were only in whether their answers were right or wrong. Once they learned this, **they tuned out**. People with a winning mindset stayed tuned to learn what the **right answers were**. Because of this greater interest in learning, they did significantly better when later tested on the material.

2. Freshman attending the elite University of Hong Kong, where everything is taught in English, entered with different proficiencies in English. They were all told the faculty was considering offering needed instruction in English and asked if they would take it?



Amongst those with poor English skills, **those with a winning mindset were enthusiastic**. Those with a limited mindset were not. **They weren't willing to expose their weakness in order to fix it. They were willing to jeopardize their college career instead.**

3. Some struggling students were taught a winning mindset. They were taught the science that shows that every time you apply yourself and learn something new, **your brain forms new connections** and you get smarter. These students became motivated and significantly improved their grades.

How mindset impacts trainers' and supervisors' evaluation skills

A lot more research is emerging on the effects of mindset in the workplace. Its goal is to see if Dweck's research findings with kids and young adults in educational settings hold true with adults in the workplace. **It does.**

In a 2005 study, nuclear power plant managers were assessed for their limited or winning mindsets. They were then told to observe and evaluate a video-recorded "poor" employee performance. They were then tasked with observing the same employee exhibit "good" performance in similar situations.

The results? Managers with a limited mindset did not fully acknowledge the extent to which the employees' performance had improved.

In another study they tasked the managers with the same observations and evaluations but the managers were first shown "good" performance, followed by "poor" performance. **Managers with a winning mindset more accurately recognized the decline in performance.** Winning mindset managers responded more objectively to performance changes.

A follow-up study established that limited mindset managers provided lower ratings of "good" performance if they had first received negative background information about an employee's prior performance.

The implications? Limited mindset managers are less likely to alter either a positive or negative initial impression of an employee's performance. This could have significant consequences.

Employees could become resentful, apathetic or want to leave **when their improvements are not recognized**. Or, an unnoticed decline in performance in critical professions like nuclear power plants, **aviation**, medicine and policing could seriously compromise organizational effectiveness and public safety. Performance declines must be recognized so appropriate remedial action can be undertaken.

How mindset impacts trainers' and supervisors' coaching

Lab studies have shown that winning mindset people are more likely to:

- * **Educate** rather than punish a wrongdoer
- * Provide helpful **learning suggestions** to a struggling fellow student
- * **Express interest** in helping other children in need by collecting money for charity.

Heslin, VandeWalle and Latham set out to find whether these findings generalized to the workplace. In two field studies, managers' mindsets predicted how employees evaluated the managers' coaching skills. It seems managers with a limited mindset decide, consciously or unconsciously, why bother investing in employee improvement if you don't believe that significant change is likely to occur?

Now what?

The research in limited and winning mindsets raises important questions.

- * Can recruits and officers be taught a mindset that increases their willingness to embrace challenges, obstacles and setbacks, then try harder, persevere and excel?
- * Can their trainers and supervisors be taught a mindset that increases their ability to recognize employee change and coach employees when needed?

The answer is an emphatic, winning mindset, YES!

Put Near Misses On Alert

- Learn to recognize when you've had a near miss. Anyone who has thought, "That was a close call," has had one.
- Always report near misses as soon as possible. A near miss one time could be an injury incident the next time.
- Inform your Supervisor of unsafe acts or unsafe conditions immediately.
- Don't take shortcuts. Follow safe rules and procedures to help prevent near misses and injury incidents.

This is good advice, whether in the air, on the ground or in the workplace!

THINK SAFETY FIRST

conditions immediately
report near misses as soon as possible

or in the workplace
on the ground
in the air