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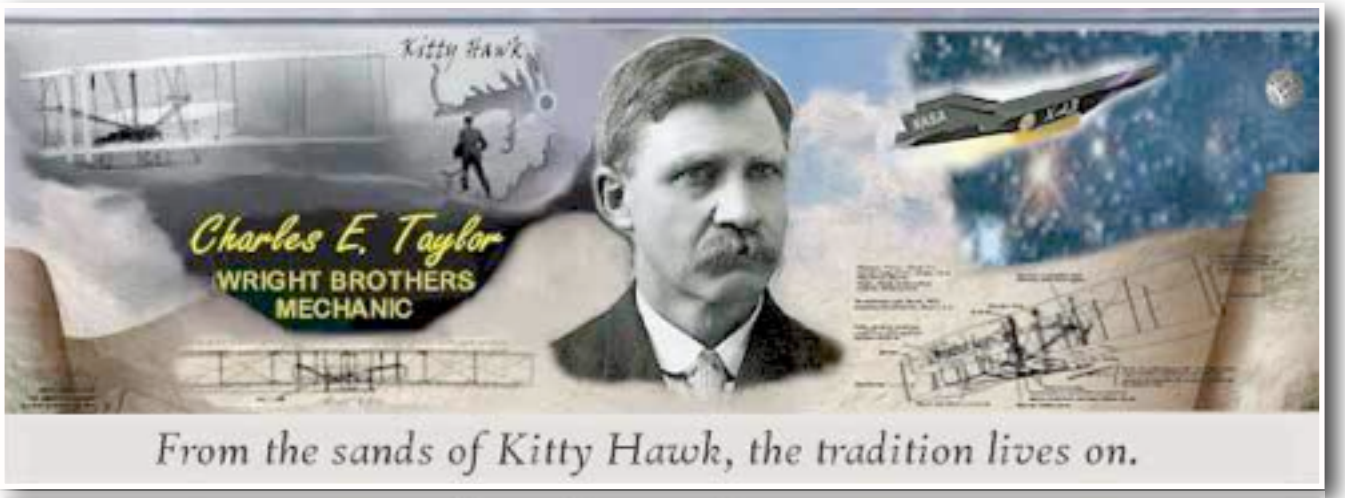

Hello all,

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

NTSB blames bad battery design—and bad management—in Boeing 787 fires

Maker of lithium-ion batteries didn't foresee spreading short circuit danger.

Bad battery design and bad engineering practices were to blame for the fire aboard a Japan Airlines Boeing 787 in Boston in 2013, according to a final report on the incident issued by the National Transportation Safety Board (NTSB) yesterday. The NTSB found fault not only with the manufacturer of the battery, but with Boeing and the Federal Aviation Administration (FAA).In a prepared statement, NTSB Acting Chairman Christopher A. Hart said, "The investigation identified deficiencies in the design and certification processes that should have prevented an outcome like this. Fortunately, this incident occurred while the airplane was on the ground and with firefighters immediately available."

There are two battery systems aboard the 787: the "main battery" in the front of the aircraft, which powers the 787's ground maintenance systems and provides backup power to the aircraft's control systems, and another set in the aft end of the aircraft used to start up the 787's auxiliary power unit (APU), a small turbine engine in the aircraft's tail which provides electrical power. Both systems used the same types of lithium-ion batteries manufactured by the Japanese firm GS Yuasa. And while the APU batteries were at fault in the Boston fire, a main battery caught fire two weeks later on an All Nippon Airways flight in Japan.

Thermal runaway

Both fires were the result of "thermal runaway"—the batteries became overheated to the point where a chemical reaction was triggered that released even more heat, causing a cascading effect that caused the batteries to explode or catch fire. Because of the fire hazard associated with lithium-ion batteries, there have been concerns about them being carried on airplanes—let alone being used as part of their electrical system—since 2004, when a battery caused a fire on a FedEx cargo plane.

In its report on the Boston fire, the NTSB cited thermal runaway as the cause, finding "[s]afety issues related to cell internal short circuiting and the potential for thermal runaway of one or more battery cells, fire, explosion, and flammable electrolyte release; cell manufacturing defects and oversight of cell manufacturing processes." There were also concerns over the engineering that went into "thermal management" of the "large format" lithium-ion batteries aboard the aircraft.

Thermal runaway can be caused in a number of ways—most of them related to a short circuit within the battery itself. Manufacturing errors, including deformations caused in assembly and poor quality control, can create conditions which lead to internal short circuits in lithium-ion batteries, as can the swelling and shrinking of battery cells as they are charged and discharged. An analysis of the batteries involved in the fire found evidence of lithium metal deposits called lithium dendrites, which can grow over time from the battery's anode and cause an internal short circuit, as well as reacting chemically with the battery cell's electrolyte in a way that creates more heat. The dendrites were found to occur in wrinkles found in some of the electrolyte material formed while it was being wound—a serious quality control issue.

NTSB recruited Underwriters' Laboratories (UL) to conduct a "short circuit abuse" test using cells of a battery provided by Boeing. The testing "showed that conduction of the heat generated by an internal short circuit in one winding of a parallel arrangement to adjacent windings could cause thermal damage in those windings and lead to thermal runaway of the entire cell," the NTSB report noted.

But the NTSB also found shortcomings in the FAA's guidance to manufacturers on factors to consider in safety assessments of equipment, as well as the agency's guidance to its own certification engineers "to use during the type certification process to ensure compliance with applicable requirements." And the NTSB cited problems with the 787's enhanced flight data recorder, which resulted in "stale flight data and poor-quality audio recording."

Failure to audit

Part of what led to Boeing and the FAA failing to catch manufacturing issues at GS Yuasa was the way the 787 was built. The electrical systems for the 787 were outsourced to Thales, which in turn was responsible for managing each of its own suppliers and ensuring they met Boeing standards. But Thales apparently made some changes to things in its systems without a Boeing sign-off, and GS Yuasa made some changes of its own that deviated from Boeing and Thales' instructions.

When the FAA and Boeing finally did perform audits on GS Yuasa, they found a raft of problems. The FAA found GS Yuasa's operation wasn't following instructions on battery component assembly and installation, wasn't properly labeling parts, and that there was "no traceability [of component and assembly part markings] to assembly drawing and instructions," according to the NTSB report.

Boeing found 17 specific issues. "Most of the noncompliance items at GS Yuasa involved adherence to written procedures and communication," the NTSB report stated, and the "non-compliance items at Thales involved adherence to contractual requirements for Boeing's approval on drawing or procedural changes."

These issues will no doubt cause a chorus of "I told you so" from many—including some Boeing workers—who have opposed Boeing's global approach to assembling the 787. By spreading the work into a modular process across multiple subcontractors and leaving only the final assembly of the aircraft to its own workforce, Boeing hoped to save significantly on manufacturing costs. But the battery problems as well as more recent issues with cracks in the wings of aircraft still in the assembly process have caused long delays in the 787's full rollout, leaving customer airlines waiting and potentially costing Boeing billions of dollars in future sales.

http://www.ntsb.gov/doclib/reports/2014/AIR1401.pdf

Report Cites Human Error in 2013 Lao Air Tragedy

Asia Pacific aviation experts are calling for more emphasis on pilot training as countries in the region prepare for rapid growth in passenger flights in the coming decades. Lao Airlines released the official report into the cause of the crash of a domestic flight last October that killed all 49 passengers and crew including foreigners.

Lao Airlines flight QV 301 was flying from the capital Vientiane to Pakse in southern Champasak province in October 2013 when the twin-engine turboprop crashed in a heavy storm on its second landing attempt.
The tragedy killed everyone on board, including nationals from 10 countries, including Australia, France, Thailand, South Korea, Vietnam, China, Taiwan and the United States.

Last Friday the Lao Government released the official report into the accident to the Lao media as well as relatives of the victims specially invited as guests of Lao Airlines.

Pilot error

Details were also broadcast on Lao TV. The TV report told how in the midst of a storm the pilot had at the last minute decided to halt the descent to the airport, to attempt a second landing but at an altitude below recommended levels and in a steep right turn.

Instead, the plane clipped trees on an island in the Mekong. Its fuselage struck the bank and the plane plunged into the river. All on board perished on impact, the report said.

The victims included an Australian family of four, Gavin Rhodes, his wife, Phoumalaysy, originally from Laos, and their two small children.
Gavin's father, Geoff Rhodes, 71, from Sydney, spoke of how he had wanted to 'represent' his son at the report's release. He summed up the report's findings.

"My interpretation was that there were three errors; pilot error, system error, and equipment error. And the recommendations that they are making as to how they can improve seem to me to try and consider all three. Does it make any difference to how I feel? No. No I don't feel any different," Rhodes states.

The report on the tragedy comes as the Asia Pacific aviation industry is seen on a pathway for rapid growth in the coming decades.

Call for safety measures

The International Air Transport Association (IATA) recently called for the continued strengthening of safety measures and improved low cost infrastructure and environmental controls.

Globally some 3.3 billion passengers are expected to board flights this year, and this is forecast to grow to 7.3 billion by 2034. IATA says that over the coming two decades the Asia-Pacific is expected to account for about two thirds of global growth.

But Hugh Ritchie, chief executive of Aviation Consultants International, says growth is often outpacing the region's aviation sector's capacity to build up skilled human resources to cope with the rapid changes.

"My problem with air safety in this part of the world is that they are growing exponentially. They are trying to build systems which are international standards. On the outside it looks like they are doing it but if you go behind the scenes and look at much of the functionality, I don't think they are achieving these levels," Ritchie explained.

Ritchie says too often in Asia there is a hesitation to make key decisions that will impact the Asia Pacific aviation industry going forward. Some efforts are underway.

The Asia Pacific Regional Aviation Safety Group, of 20 governments and 12 international organizations, including IATA, is improving the sharing of critical safety information. Institutions such as the Asian Development Bank are providing funds for air safety infrastructure.

The questions remains, is enough being done, quickly enough, to avoid tragedies like the crash of Flight QV 301.

http://www.jacdec.de/2014/11/28/2013-10-16-lao-airlines-atr-72-crashed-into-river-near-pakse-final-report-out/

Cockpit Automation Can Cause Pilots to Lose Critical Thinking Skills

In the wake of recent airline crashes, major news networks have aired concerns about pilots' ability to accurately fly "by hand" when the airplane's cockpit automation systems fail.

Although many of these concerns have centered on manual skills such as operating the airplane's controls, new human factors/ergonomics research suggests that pilots' thinking skills, such as navigating, remaining aware of the status of the flight, and diagnosing troublesome situations, are most vulnerable in today's automated cockpits.

In a new study published in Human Factors, researchers studied how the prolonged use of cockpit automation negatively impacts pilots' ability to remember how to perform these key tasks.
"There is widespread concern among pilots and air carriers that as the presence of automation increases in the airline cockpit, pilots are losing the skills they still need to fly the airplane the 'old-fashioned way' when the computers crash," said Steve Casner, coauthor of "The Retention of Manual Flying Skills in the Automated Cockpit" and research psychologist at NASA's Ames Research Center.

Casner and coauthors Richard Geven, Matthias Recker, and Jonathan Schooler studied 16 experienced pilots as they flew routine and non-routine flight scenarios in a Boeing 747-100 simulator. Levels of automation available to the pilots were varied as the researchers graded pilots' performance. The pilots also reported what they were thinking about as they flew.

Results indicated that pilots' instrument-scanning and "stick-and-rudder" skills remained reasonably intact despite prolonged periods of disuse. More significantly, however, the study found that pilots often struggled with maintaining awareness of the airplane's position when the GPS and map display were disabled, or with troubleshooting problems when the automated systems were not available to provide hints.

Furthermore, pilots who relied more heavily on the computers to handle these tasks and who allowed their thoughts to drift during flight were more likely to suffer the effects of rusty cognitive skills.

"Our results suggest that we might be a bit less concerned about things that pilots do 'by hand' in the cockpit and a bit more concerned about those things that they do 'by mind,'" said Casner. "Pilots' ability to remain mindful and engaged as they now watch computers do most of the flying may be a key challenge to keeping their cognitive skills fresh."

http://hfs.sagepub.com/content/56/8/1506.full.pdf+html

http://hfs.sagepub.com/

Impediments to Reporting

Robert Baron, Ph.D

The Aviation Consulting Group

The company's SMS is in place. The reporting system is up and running and employees have been trained about the importance of reporting hazards and unsafe conditions. Yet, during informal interviews with employees, many admit that they have not—and probably will not—use the reporting system. Reasons include:

- "I don't have the time to fill out those reports."
- "I don't trust management with the reports, even though they claim they are non-punitive and confidential."
- "I'm sure other people will make the reports."

As the safety manager, now what do you do? You know the importance of the reports (they are integral to your proactive hazard identification and risk assessment process).

Here are some suggestions:

Regarding time, time is a relative thing. People use the excuse that they don't have enough time when, in fact, they might just be trying to say that they are not genuinely interested. Many employees feel that they have nothing to gain from submitting a report. This is mostly attitudinal and can be changed during the training process by explaining to employees the importance of reporting (especially during SMS induction training). Be explicit. Talk about the overall benefit to not only the company but also to individual employees (they may be preventing their own accident or incident).

Regarding management trust, why is there a lack of trust? Is it actual (an employee was fired for submitting a voluntary, "non-punitive" incident report)? Or is it perceived (I just don't trust management?). If it's actual, it's a management issue and management needs to make a quick correction to get the trust back. This can be a protracted and arduous process but "talking the talk" and "walking the walk" are absolute management requisites for a successful SMS. If it's perceived, then it's an employee issue. It's normal for employees not to trust management. The job, then, is for management to foster a culture of trust. This can be done in a number of ways, but for the most part it involves management commitment to safety, good role modeling, high visibility, and good (open and transparent) communication.

Regarding other people making the reports, this may be due to pluralistic ignorance, which means that employees assume that "someone else will take care of it." This may also be known as diffusion of responsibility. When everyone thinks this way then nothing gets done—it becomes an organizational norm. Thus, in training, it would behoove the instructor to discuss these social-psychological phenomena a bit.

Of course there is a lot more to talk about but I just wanted to highlight some of the more common impediments to reporting. Hopefully, management, employees, and trainers will absorb a few good nuggets from this piece and reports will start to increase!

Dr. Bob Baron is the President and Chief Consultant of The Aviation Consulting Group (TACG). His specializations include Human Factors (HF), Safety Management Systems (SMS), Crew Resource Management (CRM), Line Operations Safety Audit (LOSA), and Fatigue Risk Management (FRM). He consults with, and provides training to, hundreds of aviation organizations on a worldwide basis. www.tacgworldwide.com

Look at How Far We've Come

by Dr. Bill Johnson FAA Chief Scientific and Technical Advisor for Human Factors in Aircraft Maintenance Systems.

Earlier this year (AMT, April '14), I wrote about the history of a quarter of a century of maintenance and engineering human factors (M&E HF) training. Training is very important but it is not enough. Organizations now recognize that there is payback in the integration of M&E HF into the entire organization. This article is a natural unplanned Part II to the April training discussion. It reports on positive progress and on opportunities for improvement.When AMT Editor Ron Donner asked me to provide a 25-year evolution of M&E human factors, I quickly and humbly realized that he was asking the "right" person. I have been fortunate enough to be among a small group of individuals that not only strongly influenced M&E HF since 1988 but have sustained their efforts to the present time. Among the important partial list of long-time M&E HF professionals, mostly from the America, include: James Reason (retired from University of Manchester), Bill Rankin (retired from Boeing), Colin Drury (retired from University of Buffalo), David Marx (Outcome Engenuity), the Honorable John Goglia (retired from US Airways and NTSB), Gordon Dupont (System Safety Services), and Jean Watson (FAA). Ms. Watson is especially important since she played a key role in obtaining FAA start-up and sustainment funding from 1988 to 2000. Many of the concepts described herein may be attributable to one of the persons listed above.
Here are six interventions that have influenced the history of M&E HF. They include:

1. Training: Since the April '14 AMT covers training, there are few details here. Some of the initial programs tried to focus on the organization, as suggested by James Taylor (retired from University of Southern California). However, focus on individual human strength and weakness became the norm. Regardless of the specific approach, training helped "human factors"

become a household word. HF training evolved from classes filled with only mechanics and engineers to eventually include nearly everyone in the maintenance organization. The successful training expanded and was adopted throughout the world. In most countries human factors training is now mandated. Many U.S. maintenance organizations adopt HF training because of the recognized cost and safety impact.

2. The HF Models: We cannot talk about a 25-year history of M&E HF without mentioning at least three of the most popular learning aides, all evolved in the mid-'90s. Professor James Reason created the Swiss cheese model, comparing aviation maintenance organizations, to a stack of sliced cheese. When the holes of the pile aligned it represented a situation where there were insufficient defenses (solid cheese) to stop the occurrence. Gordon Dupont introduced the "Dirty Dozen," a listing of 12 conditions that contribute to human error. I worked with Dr. Mike Maddox to create the PEAR, which said that HF attention/intervention must be focused on People, Environment, Actions, and Resources. The Swiss cheese, the Dirty Dozen, and PEAR remain as timeless aids to help address maintenance human factors issues.
3. Involving the Worker: The early trainers came from the ranks of academia. They were psychologists, educators, degreed engineers, etc. It became very clear that trainers benefited from maintenance field experience. Thus, maintenance personnel were extremely well suited to lead/facilitate the human factors programs. John Goglia emerged from the ranks of organized labor leadership at US Air (now US Airways). He was instrumental in leading the rank and file maintenance personnel to actively accept and participate in many HF endeavors. Of course, the Honorable Mr. Goglia eventually became the first A&P mechanic to serve as an NTSB board (Thank you President Clinton). Goglia pushed for attention to M&E HF at every opportunity, helping him to earn a friendly title as a Godfather of M&E HF. He impacted all of maintenance HF across the globe and continues to foster that goal.
4. HF Focus on Event Reporting: In the early '90s the Boeing Company and its industry partners, under the leadership of a Boeing engineer named David Marx, created a system to investigate the contributing factors to maintenance-caused events. I participated in the early Boeing meetings as the system evolved. Many of the early, and very long deliberations, resulted in the success of the program that eventually became the Maintenance Error Decision Aid (MEDA). A key decision was to create a locally manageable system that was not dependent on industry data sharing. This permitted companies to proceed quickly, without associated complexity of government, lawyers, etc.

Dr. Bill Rankin eventually took MEDA to the level of industrywide acceptance that it has today. Dr. Rankin and his Boeing team eventually bundled MEDA with human factors and safety management systems training/implementation. Boeing has trained more than 850 maintenance organizations since the '90s. The tool remains relevant today as it provides data to the FAA Aviation Safety Action Program (ASAP) and the Aviation Safety Information Analysis and Sharing (ASIAS).

5. Just Culture: The concept of "just culture" has roots back to the start of Boeing's MEDA. The initial premise was that no worker comes to work to make an error. The error, therefore, is triggered by personal or organizational events that should be identified and corrected. Humans generally do not want to admit when they make an error. In most societies the reaction to a human error is to punish the human. The result is that workers will not report errors and organizations will not learn from the errors. Errors will be repeated. Voluntary reporting is dependent on "just culture." I am not, for a minute, suggesting that our entire aviation industry has adopted just culture. In a recent survey of North American and European M&E organizations (See AMT September '14), the combination of voluntary reporting and just culture remained as top M&E HF challenges.

FAA, EASA, and other National Aviation Authorities have been reasonably successful in making legal changes to protect workers who voluntarily report error. M&E organizations must evolve to minimize the scorn and impact on those who voluntarily report. As attitudes change, "old school" managers and regulators must also change or make way for those who recognize the value of voluntary reporting.

6. Integration of M&E HF with Quality and Safety: As mentioned above, initial HF was all about training. The training was supplemented by a variety of positive industrial engineering influences from university R&D teams. For example, Dr. Colin Drury lead numerous projects related to topics like workplace design, communication during shift change, improving visual inspection, and much more. By the 2000s the HF impact was affecting the entire organization. M&E HF was becoming relevant. There was an increase in the number and managerial rank of those responsible for HF. Department and middle managers, including top executives were addressing HF issues. That meant there were increased instances of proper attention to procedures, tooling, scheduling, and general resourcing for the maintenance work force.

As M&E HF evolved there was increased attention to collecting and using cost data on human error. Some organizations have used the FAA and other return on investment models to justify investments on HF and other safety interventions. This approach has not fully matured but continues in a positive direction. Many maintenance organizations including Parts 145, 135, 121, 91, and others adopt M&E HF practices, without regulation. That is the very best indication of the recognized value of M&E HF.

Safety management systems (SMS) are an excellent way to help integrate M&E HF into the total organization. HF personnel should work with SMS counterparts to know the key performance indicators (KPI) that are impacted by M&E HF. At the same time there must be assurance that there is a two-way data flow. That will help ensure that many additional organization issues can possibly be addressed by M&E HF.

Are We There Yet?

No we are not there yet! The toughest thing to change is culture. Our industry has been on the M&E HF cultural change journey for nearly 30 years. We have made great progress. However, minimizing human error is a very difficult, honorable, and continuous goal. Suffice to say there is a lot of job security if you are in the business of minimizing human error.

Aviation industry faces new risks, rising claims costs despite improved safety

Despite several recent disasters, the aviation industry's safety record has improved over the long term, although new risks are presenting a threat to the industry, according to a new report from Allianz Global Corporate and Specialty.

Currently, there are fewer than two deaths per 100 million commercial air passengers, a massive improvement over when the commercial jet industry was in its early stages, Allianz says. Between 1962 and 1971, there were 133 deaths per 100 million passengers, it suggests.

However, the “increasing likelihood of cyber attacks, greater reliance on automation and the anticipated growth of drones in commercial use” are all presenting risks to the aviation industry moving forward.
“New generation aircraft are highly exposed to cyber crime due to the prevalent use of data networks, onboard computer systems and navigation systems,” Ludovic Arnoux, AGCS’s global head of aviation risk consulting commented in a statement on the report.

“Data breaches and cyber attacks are perceived to be growing risks,” Arnoux added.

The cost of aviation claims is also rising because of new plane materials, liability-based litigation and “ever-more demanding regulation,” according to Allianz.

https://www.allianz.com/v_1417617209000/media/press/document/AGCS-Global-Aviation-Safety-Study-2014.pdf

Dietmar Eckell: Miracles of aviation history

January 1965, Alaska. A Fairchild C-82 is flying above the Arctic Circle when it encounters trouble. “The plane’s electric system failed and they crash-landed in the night in the tundra forest, cutting down many trees. They survived at -45 degrees Celsius by making a big fire from the wood they had cut. It is very remote up there: they were really lucky that the fire was spotted by another plane three days later and they were rescued.” German photographer Dietmar Eckell is describing one of the stories he discovered while researching his Happy End project, which records plane crashes that had no fatalities. He has even been contacted by those who survived: raising the money to print a book of the photos last year, he was contacted by the pilot of this Fairchild C-82.

http://api.viglink.com/api/click?format=go&jsonp=vglnk_14184292704017&key=a8b3db45c5a4f36e59ba21e41d544c09&libId=a16320a5-45ab-49b7-972a-b6b9afc19185&loc=http%3A%2F%2Fwww.bbc.com%2Fculture%2Fstory%2F20141209-miracles-of-aviation-history&subId=547&v=1&out=http%3A%2F%2Fwww.dietmareckell.com%2F&title=BBC%20-%20Culture%20-%20Dietmar%20Eckell%3A%20Miracles%20of%20aviation%20history&txt=Happy%20End%20project

http://igg.me/p/340928

Airport Workers At 10 Airports To Join With $15 Hour Fast Food Strikers December 4.

by John Goglia

Airport workers at 10 major airports – including JFK, LaGuardia, Newark, Boston, Philadelphia, Atlanta and Seattle – have written to the CEOs of the six major US Airlines – Delta, American, JetBlue, United, Southwest and Alaska – stating that "as airport workers we have pledged to stand together with people who work in home care and fast food to fight for $15 an hour wages. Like fast food workers and home health care aids in this fight, we face a struggle to survive while making poverty wages." These workers include baggage handlers, ticket and aircraft and airport cleaners. While they are not directly employed by the airlines, they are employees of airline contractors and subcontractors. The fast food workers they are standing with have called for a strike for December 4. According to a Bloomberg report, "fast food workers in dozens of cities are planning to walk off the job [December 4] as they continue pushing for higher wages and union rights." Whether workers will demonstrate or walk off their jobs at these airports is unclear at this time.

I have long been concerned about the wages paid to these airport workers. While they do not perform the glory jobs of the airline industry, they are critical to the safety and security of the system. Recently I wrote about my concerns that some of these front-line workers were not properly trained or given appropriate protective gear to prevent the spread of Ebola via airline transportation.

Airport ground worker training and experience on safety issues is one I am personally familiar with as a former airline employee and Member of the National Transportation Safety Board. Airline cost-cutting measures over the years have resulted in airlines contracting out work that was once performed by the airlines themselves. Often, these contracts go to the lowest bidders, who in turn pay their workers very low wages. These low wages result in high worker turnover at many facilities as employees change jobs frequently for even a small increase in salary. In addition, low wages frequently result in employees working two or even three jobs, making them vulnerable to fatigue and fatigue-related mistakes.

I hope the airlines sit down and talk with these workers as improving pay will help increase the level of experience of these workers and cut down on the number of jobs they need to hold in order to make ends meet.

Among other things, inexperience and fatigue play major roles in the number of costly incidents and accidents on the ramp between ramp vehicles driven by these airport workers and aircraft and clearly can affect an airline's bottom line.

http://www.forbes.com/sites/johngoglia/2014/10/19/airlines-not-doing-enough-to-protect-aircraft-cleaners-and-passengers-from-ebola-risk-union-charges/

Analyst: Aerospace composite industry could double by the early 2020s

A robot at Spirit AeroSystems inspects the forward portion of a 787 for any irregularities in the composite structure in 2012.

An aviation analyst said this week that use of composites in aircraft will continue to grow.

There's a great future in plastics. The advice given to Dustin Hoffman in the 1960s in his role as Benjamin in "The Graduate," is still being touted today. This time, the reference is to composite materials used in aerospace.

Composites are a much smaller market when compared to metals used in the industry.

But "composites look to be the wave of the future for commercial aero transport," Robert Stallard, an aviation analyst with RBC Capital Markets, wrote in a report to investors this week.

The composite market for aviation is relatively small but growing fast, Stallard wrote.

He noted that Composite World put the current aerospace composite market at about $10 billion. That number could reach $20 billion by the early 2020s, Stallard said.

By the mid to late 2020s, Stallard expects that the replacements for today's narrowbody airliners will likely be made primarily from composites.

Plane-makers like the materials because of their strength, tensile flexibility and anti-corrosive properties.

That means lighter-weight, more fuel-efficient airplanes that require less maintenance, Stallard said.

That's attractive to the the airlines in a plane's life-cycle costs, even though composite aircraft come with higher price tags upfront, he said.

For example, composites make up more than 50 percent of the content in Boeing's 787 and the Airbus A350.

Composites have been on aircraft since the 1950s, but they didn't appear in meaningful quantities until the mid-1980s, when the Airbus A310 and A300-600s used carbon-fiber reinforced plastics in their vertical fins and the DC 10s and L-1011s used composite rudder and aileron segments, Stallard noted.

More recently, the Federal Aviation Administration and the European Aviation Safety Agency, Europe's FAA equivalent, have implemented certification standards to certify composite aircraft parts.

That ushered in a new wave in the adoption of composite materials to lighten weight and improve corrosion resistance, Stallard said.

Besides Boeing and Airbus, composites are used on military programs, such as the F-35 and A400M, on business jets and on general aviation planes. There are also non-aerospace composites that are used in the production of wind turbines, cars, sporting equipment, as well as other products and systems.

Bombardier is one of the heavier users of composites across product lines, such as the all-composite Learjet 85. The CSeries is about 50 percent composite.

Stallard expects some consolidation in composite providers. Dozens of companies supply raw composite materials or are developing and manufacturing finished composite products for the aerospace and defense markets, he said.

“We think the combination of fragmentation (of providers) and strong growth could make composites one of the prime areas for future aerospace consolidation,” Stallard wrote.

The increase in the use of composites has also meant higher use of titanium for added compression strength, he said. Titanium substructures have better corrosion and fatigue characteristics than most traditional production metals.

Sleep that Sabotages Leadership

A recent Harvard Business Review recommendation, “Your Abusive Boss is Probable an Insomniac,” is a summary of findings from a study published in the Acadmey of Management Journal.The researchers studied 88 leaders and their teams to find out if the leaders’ sleep habits affected performance at work. The result?…you guessed it, but there’s a twist:

We found that daily leader sleep quality, but not quantity, influenced the leader’s self-control and abusive supervision behavior, and ultimately the degree to which his or her subordinates were engaged in their work that day. It is not clear why sleep quantity did not have the effect we predicted, but the effect for sleep quality was very clear; a given leader engaged in more jerky boss behavior after a poor night of sleep than a good night of sleep, and this influenced his or her subordinates to disengage from work.So, we should pay attention to how well we sleep in addition to how much we sleep. And it turns out from the study that the poor sleep quality didn’t just impair the leader, it affected subordinate behavior as well:

Perhaps what is most interesting about these findings is that leader sleep influenced subordinate outcomes. Although most of us have some appreciation that our own sleep influences our own behaviors and outcomes, not many people would expect someone else's sleep to influence one's own behavior. But this is precisely what we found; leader sleep quality influenced subordinate work engagement. Thus, if leaders want their subordinates to be truly engaged, they should start by looking at their own sleep.

What About Military Leaders?

Unquestionably, the military is a sleep-challenged profession. Combat operations and intense training events provide ample opportunities to sacrifice sleep. We're good at driving-on despite fatigue (to a point…). But we have lots of leaders who also figure out a way to short themselves of a good night's rest in garrison, when no bullets are flying. (I've seen that movie plenty of times…heck, I've starred in that movie!)

But if sleep quality/quantity affects team behavior, shouldn't we consider it lack of discipline not to arrive at the point of departure in a peak state of performance?

We leaders need to take a hard look at our own physiological states. It's cool to be "the rough commander who has a bit of an edge and a temper from time to time"…until you start destroying the very thing you're tasked to be responsible for.

Leaders carry more psychological burden than other members and need to shape their environment to maximize performance. Establish wake-up criteria so your people know when to rouse you. Set a cut-off time for work-related activity, so you can relax your body and mind before lights-out. Put some effort into assessing your lifestyle activities like sleep time, hydration, caffeine intake, fitness, and food. They all play a part in shaping your work behavior.

Resources

See my August 2014 post, "Getting It Done" – 16 Resources for Preventing Distraction, Maximizing Productivity, and Prioritizing with Purpose, for a long list of productivity topics, including sleep.

Also go to Michael Hyatt's podcast on sleep and productivity.

Finally, the HBR article mentions this Huffington Post article on sleep quality.

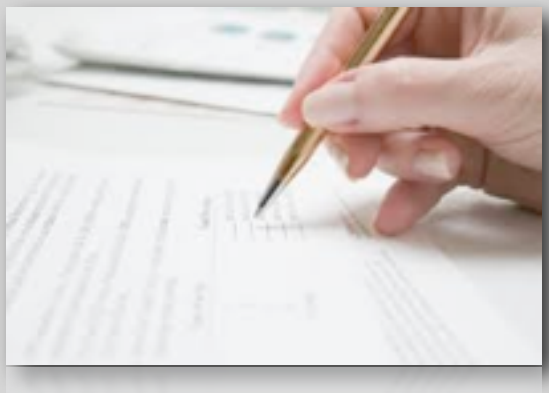
Questions for Leaders

- How could your improve your discipline in preparing yourself for peak physiological performance?
- Does your team know when they should call or wake you with important information?
- How are you teaching your organization's leaders to be intentional about their own performance?

https://hbr.org/2014/11/research-your-abusive-boss-is-probably-an-insomniac

http://amj.aom.org/content/early/2014/11/03/amj.2013.1063.full.pdf+html

Applications for 2015 AMT Employer Award Program Are Now Available



The National Air Transportation Association (NATA) is pleased to announce that applications for the 2015 Aviation Maintenance Technician Employer Award Program are now available.This award program is designed to recognize companies that employ aviation maintenance technicians (AMT) and encourages and supports AMT training. The award is based on the percentage of AMTs employed by a maintenance organization that participate in qualified training events.

"We are very excited that the AMT Employer Award continues to grow into its fifth year," said NATA President & CEO Thomas L. Hendricks. "The sheer success of this award program demonstrates the importance our members place on quality AMT training."

Applications for the 2015 Aviation Maintenance Technician Employer Award Program are now available and will be accepted through January 30, 2015. For more information on the program, or to download an application packet, click links below.

NATA, the voice of aviation business, is the public policy group representing the interests of aviation businesses before Congress and the federal agencies. For more information about NATA, please visit www.nata.aero, www.twitter.com/nataaero or www.facebook.com/nataaero.

http://www.nata.aero/enewsletterpro/t.aspx?S=2&ID=1697&NL=20&N=2020&SI=81543&URL=http%3a%2f%2fwww.nata.aero%2fAwards%2fAMT-Award.aspx

TED Ideas Worth Spreading

This year, explorer Ben Saunders attempted his most ambitious trek yet. He set out to complete Captain Robert Falcon Scott's failed 1912 polar expedition — a four-month, 1,800-mile round trip journey from the edge of Antarctica to the South Pole and back. In the first talk given after his adventure, just five weeks after his return, Saunders offers a raw, honest look at this "hubris"-tinged mission that brought him to the most difficult decision of his life.

http://www.ted.com/talks/ben_saunders_to_the_south_pole_and_back_the_hardest_105_days_of_my_life