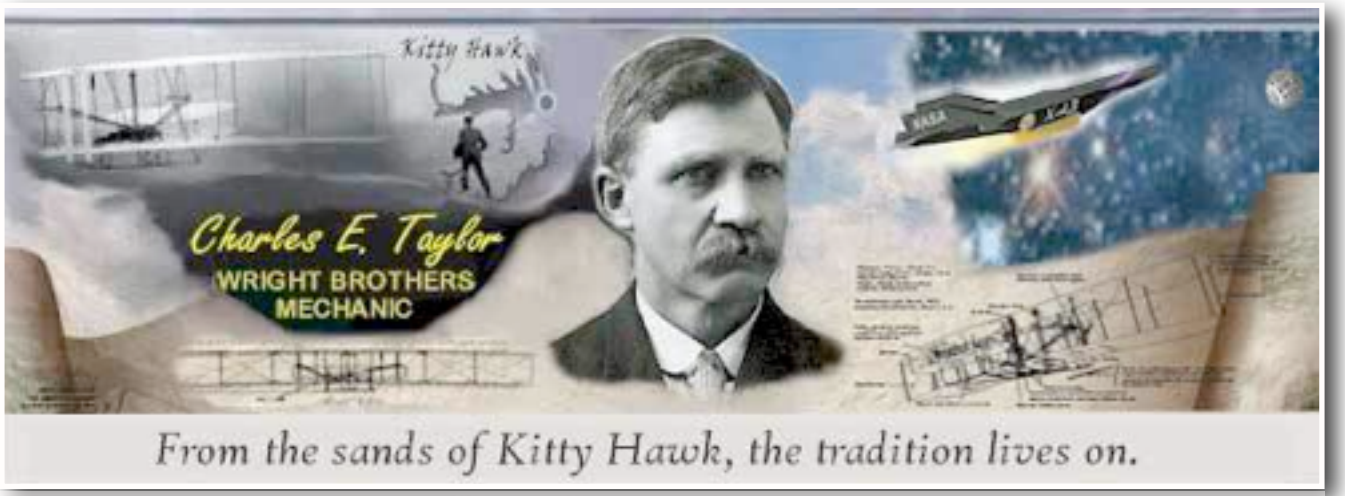
Aviation Human Factors Industry News

Volume XI. Issue 11, May 31, 2015



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:

Crashed Asiana A320 drifted below glidepath in low visibility

Japanese investigators have indicated that an Asiana Airlines Airbus A320 began to deviate from its descent path shortly after its autopilot was disengaged, before it collided with the localizer antenna at Hiroshima.

The A320 had been conducting the area navigation (RNAV) approach to runway 28 on 14 April.It hit an approach light at a height of 4m before carving through the antenna. Flight OZ162 subsequently veered off the runway, suffering substantial airframe damage.

Preliminary findings by the Japan Transport Safety Board show that weather conditions were not ideal, with light rain and fog reducing visibility on the runway to 300m in places.

The aircraft passed the final approach fix at a height of just above 3,000ft and initially followed the correct descent profile.

Its autopilot was disconnected at around 2,100ft but the inquiry's data indicates that, after this switch to manual operation, the A320 began to drift below the normal glidepath. Its airspeed stayed largely constant, around 130kt, according to flight-recorder data released by the JTSB.

The glidepath deviation gradually became more pronounced until the aircraft hit the localizer, situated 325m before the runway.

Just 2s before the impact the recorder data indicates an attempted go-around, with changes to the side-stick input and the engine thrust-lever positions.

After destroying the antenna the A320 shed debris before reaching the runway, its aft fuselage making ground contact 148m short and its main gear following at 136m.

It travelled 725m along the runway but then started veering to the left and exited 1,154m from the threshold, coming to rest facing almost in the opposite direction.

Passengers evacuated the aircraft through slides, suffering only minor injuries during the accident.

Asiana had previously disclosed that the aircraft's captain had accumulated over 8,200h and the first officer nearly 1,600h.

Investigators have yet to determine the primary cause and contributing elements to the event.

U.S. safety agency urges pilots to avoid distracted flying

U.S. safety officials on Wednesday reminded pilots to look out for other planes and make their own aircraft known during flights, saying air collisions can occur if pilots are distracted by cell phones, tablets or other wireless devices.

After four small-plane collisions that caused eight deaths, the National Transportation Safety Board (NTSB) issued an official "safety alert" advising pilots to maintain fundamental "see and avoid" vigilance by scanning for traffic throughout a flight, using lights and clearly communicating their intentions."Accidents have occurred in which pilots operating near one another did not maintain adequate visual lookout," the federal safety agency said.

"The presence of technology has introduced challenges to the see-and-avoid concept. Aviation applications on portable electronic devices such as cell phones, tablets, and handheld GPS units, while useful, can lead to more head-down time."

NTSB pointed to four collisions involving Piper or Cessna aircraft that have occurred over the past four years. Three of the mishaps proved fatal.

In the deadliest accident, a pilot and three passengers were killed in 2011 near Talkeetna, Alaska, when their Cessna 180 collided with a Cessna 206 about 900 feet (274 meters) above ground. NTSB said the pilots of the two single-engine aircraft were monitoring different radio frequencies and failed to see each other. The airline-rated pilot of the Cessna 206 was not injured.

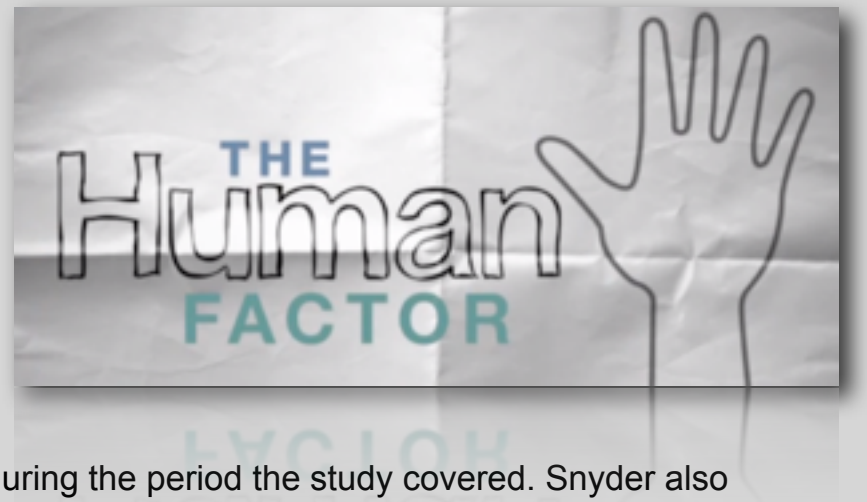
Commercial airline pilots increasingly are using tablet computers in the cockpit in place of paper flight plans and navigation charts. But, under Federal Aviation Administration rules, the devices are not allowed for personal communications or activities.

The devices are allowed for general aviation, including small planes, but the pilot is responsible for determining whether a device's electronics will interfere with flight instruments.

Software makers have produced a host of pilot applications for phones and tablets that offer radar and navigation services, approach charts, terrain awareness and weather graphics.

When is a Crewmember Fit for Duty?

Determining a pilot's fitness for duty can pose a challenge for business aviation operators, and a lack of any FAA guidance on the issue compounds the problem, said Dr. Quay Snyder at the Flight Safety Foundation business aviation safety summit (Bass) in Fort Lauderdale, Fla., last month. "The FAA medical certificate is practically worthless," asserted Snyder, president of Aviation Medical Advisory Service. "Take the exam, pay your fee and pick up your certificate with a side of fries," he told the audience. "The medical only calls attention to items pretty much self-reported." What about disqualifying issues unknown to or more closely guarded by pilots?



Last year the NTSB listed fitness for duty related to the use of prescription drugs and over-the-counter remedies as one of its top 10 concerns following a 22-year study. Snyder said, “The use of impairing drugs by pilots involved in fatal accidents rose to 23 percent from 11 percent” during the period the study covered. Snyder also pointed to a “national epidemic in which eight percent of the U.S. population is dependent upon opiates of some sort. Pilots are not exempt from these numbers.”Fitness for Duty Plan

“There’s nothing in our SMS to guide us through the process even though the pilot is the [system component] most likely to fail,” he pointed out. A survey conducted at last year’s Bass revealed more than half of the audience members were employed by companies with no formal procedure to handle fitness-for-duty issues. A smaller percentage of those surveyed said their company handles these matters ad hoc. “I don’t want to see more FAA regulations either. They won’t help anyone,” lamented Snyder. He suggested better tracking of training events might be useful, so long as everyone in the department is evaluated the same way. Some non-traditional techniques, such as talking to the pilot involved, might be a better way to identify fitness problems. He recalled a case where one pilot asked the other for assistance applying the brakes during a rejected takeoff. A subsequent medical diagnosis determined the pilot was displaying the early onset of Lou Gehrig’s disease.

Snyder cited many compelling reasons to create a fitness-for-duty plan. First, an unfit pilot represents a huge safety liability, putting the other pilot, cabin crew and passengers at risk, and that is to say nothing of the aircraft itself. Of course, denial by the pilots is always a concern as they worry about keeping their jobs, and other pilots generally are reluctant to snitch on a colleague. Snyder told the audience, “These aircraft are certified for two pilots for a reason. Operating with just one is dangerous.”

He concluded, “A pilot who has been performing just fine in a flight department doesn’t suddenly change [his behavior] without some underlying reason. The goal is [always] to get the pilot back to flying, or at least identify and remove the hazard from the department” while the pilot seeks treatment.

"We need to be ethical and fair to everyone," Snyder concluded. "We need to optimize health, which reduces the costs everywhere, and leadership teams need to support that concept. Evaluations must be confidential and comprehensive and handled with dignity and respect for the employee."

FAA Expands "Lessons Learned" Safety Website

The Federal Aviation Administration (FAA) recently added six new accident modules to the agency's one-of-a-kind "Lessons Learned" online and publicly available safety library. The library captures valuable information learned from some of the world's most historically significant accidents.

New modules include:

- 1960: Capital Airlines Viscount (Turbine Engine Icing, Engine Isolation)
- 1995: Atlantic Southeast EMB-120 (Structural Inspection, Propeller Blade Failure)
- 1996: Birgenair B757 (Avionics Confusion, Cockpit Resource Management)
- 1997: Fine Air DC-8 (Cargo Loading, Organizational Safety Oversight)
- 2000: Air France Concorde (Fuel Tank Structural Integrity, Minor Repair Processes)
- 2008: British Airways B777 (Fuel System Icing, Engine Isolation)

The library's collection now totals 76 modules, with almost 20,000 subscribers. The initiative began with the release of 10 modules just six years ago.

Each module relies heavily on multimedia as a means to educate and engage the aviation community. Creative combinations of videos, animations, and photographs make the information easy to follow and understand in just 30 minutes, even for an aviation novice.

Learning from the past can help keep future accidents from occurring under similar circumstances or for similar reasons. Lessons learned modules cover a wide range of operational, maintenance, and design issues, and go through months of vetting by FAA employees, aviation industry experts and other international regulatory authorities. This coordination ensures the content is accurate, complete and internationally relevant.

You can research the Lessons Learned library at: http://lessonslearned.faa.gov/

AN ARRAY OF ASSUMPTIONS - ASRS CALLBACK

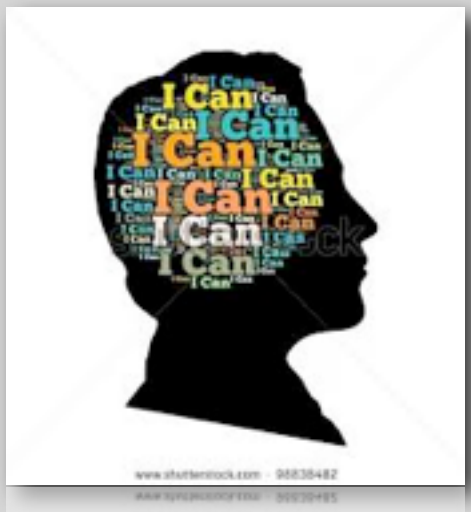
When you assume that you have the right parts and you assume they are going on the correct engine, what could go wrong? Verification of the paperwork associated with the job could have saved a lot of time, labor and embarrassment in this wrong engine, wrong parts incident.

- I started my service on [a B737 aircraft]…#1 engine. Another AMT was to start the fuel nozzle replacement. After I completed my service, I noticed the #2 engine cowlings were opened up so I assumed that must be the engine getting the fuel nozzles…. When the nozzles arrived, one AMT took the left side of the engine and another took the right side and they began removing the fuel nozzles to replace them. I was the third person so I was handing tools to them and getting whatever they needed….

After the Inspector had checked the engine for safety and security, I closed the #2 engine cowlings. It wasn't until the next day that I was informed that the nozzles were the wrong part number and the work was supposed to have been done on the #1 engine. I had never looked at any of the paperwork to verify the part numbers or which engine we were supposed to work on.

A dangerous attitude

After one final cough, the propeller ceased to spin and the engine went to sleep. As the fuel was cut off from the carburetor, so did the adrenaline in the young pilot's system. While the remnants of the adrenaline ebbed away, his legs began to shake. He tried to stop the shaking, but failed miserably.



The ground crew waiting outside irritated him with their presence. He did not want to keep them waiting, but he had this urgent need to stay in the cockpit for a few minutes more.The pilot had just come from a tense and exhausting cross-country training flight. Caught between two thunderstorms, he had to deal with near-zero visibility while going through pouring rain. Sudden gusts, updrafts and downdrafts alike, also joined the mix.

In itself, it is a nerve-wracking experience to fly through a thunderstorm in a large jetliner. What more in a small-engine, twin-seat trainer plane? More often than not, large aircraft will veer away from terrible weather even if they are equipped to handle it. With both the alternate and destination airfields socked-in, the pilot had no choice but to fly through an unfamiliar mountain pass in steadily deteriorating weather to be able to get home. It was no joke. It was a risky endeavor. Losing sight of the terrain and getting lost could lead to a violent rendezvous with the mountains. An engine failing at this point would also have plane and pilot ending up with a similar fate.

In flight school, instructors always repeat this mantra: The superior pilot uses his superior judgment to avoid situations that require the use of his superior skills. But at that moment, the young pilot was far from being a superior pilot;

he was, rather, a scared fool. A truly dangerous attitude for an aviator is the macho, I-can-do-anything attitude. It was what the young pilot had until that day. Fortunately, the harsh lesson that fate was teaching him had an ending that, after a grueling hour which felt to him like it would go on forever, put him safely back on solid ground.

He made it through that mountain pass unscathed, managing to find a hole in the dark mass of angry cumulonimbus clouds. It took all his strength to keep the small aircraft upright as it was steadily battered by the violent mountain winds, holding on with the sheer willpower and stamina of youth.

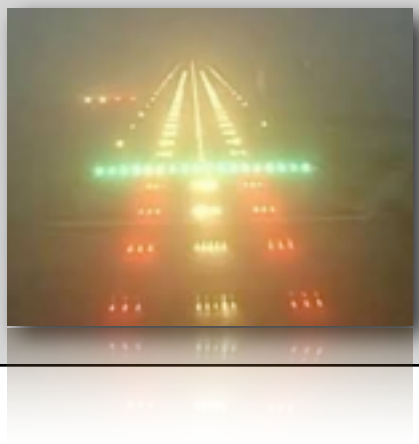
The pilot has since changed his wicked ways and moved on to bigger things in his career. But from time to time, he goes back in his mind to that day to remind himself of the importance of not taking things for granted and of not mindlessly pushing the envelope of safety, not just in flying but in life as well.

It's a story that I will not readily forget. It's a straightforward tale with a moral that can be readily applied to our daily existence, pilot or not. There's this YOLO attitude among today's youth, which caused the memory of this story to resurface. "You only live once" had the original message of grabbing every opportunity that comes one's way, but it has morphed into something more similar to social-media-approved recklessness.

Another lesson that we may pick up from this story is that, although it ended well that time, Lady Luck may not always be on our side.

NTSB Says FAA Needs Better Landing Procedures

As part of its investigation into several events when airplanes landed at the wrong airports, the NTSB told the FAA this last week it should amend its ATC procedures. "Controllers [should] withhold landing clearance until the aircraft has passed all other airports that may be confused with the destination airport," the NTSB said.



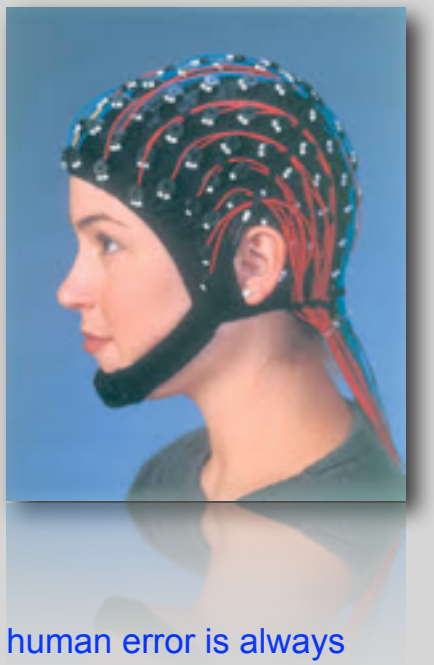
Also, software that warns controllers about minimum safe altitudes should be modified to also warn them if the airplane crew is trying to land at an airport different from the one in the flight plan., the software automatically switches to the airport where the crew is landing, without signaling a change.

The two new safety recommendations (PDF)are based on the NTSB's investigations of two recent wrong-airport landing events, including a Southwest flight that mistakenly landed in Branson, Missouri, in January 2014, and an Atlas Air B747 cargo flight that landed at the wrong airport in Wichita, Kansas, in November 2013. Both aircraft landed safely and nobody was hurt in either incident. The NTSB also cited several other recent incidents, including a Beech Bonanza that mistakenly landed at an Air Force base in Shreveport, Louisiana, last November.

http://www.avweb.com/avwebflash/news/A-15-009-010-ntsb.php

Tracking pilots' brains to reduce risk of human error

Earlier this year, a Germanwings jet carrying 150 people crashed into a remote area of the French Alps, killing everyone on board. Authorities say co-pilot Andreas Lubitz, who had suffered from suicidal tendencies and depression, intentionally crashed the Barcelona-Dusseldorf flight but they are still puzzling over why he did it.
Scientists from France, the US and Japan are now working together to better understand how a pilot's brain functions. The Germanwings accident was a unique case, so scientists have extended their research to understand pilots' physiological and neurological reactions to stress, with the aim of being able to identify the signals that precede potential error in order to prevent it.



No matter how well trained and experienced a pilot is, human error is always possible. In this lab in the French city of Toulouse, a team is developing instruments that might help the pilot handle the workload:

"We are trying to better understand what can cause human error by using the same tools as neuroscientists, like electro-encephalography, measuring the heart rate, perspiration, the pupil diameter, eye tracking, which means tracking the pilot's gaze at any given moment," explains Mickael Causse, assistant professor at the Aeronautical and Space Institute (ISAE SUPAERO) in Toulouse.

"So we're carrying out all of these tests in order to better understand how a human being functions in poor conditions, under stress, or when tired, in order to prevent accidents when that's possible."

Wired-up pilots flying a real, light aircraft are put into situations of forced landing. Meanwhile, their brain activity is measured and recorded. Frédéric Dehais, professor of neuroergonomics at ISAE, explains how the eye tracking device works: "It's very light, it weighs less than 80g. It has a frontal camera which shows us where the pilot is looking, his field of vision. And here we have another camera, a smaller one, that films his eye pupil and which shows us, in real time, in which direction the pilot is looking."

Pupil dilation is a reliable external indicator of mental stress, according to Dehais. The scientists can watch as a highly stressed pilot's brain literally shuts down many of its critical faculties and shifts from rational decision to emotional reaction, to a state of so-called "inattentional deafness", where audible alarms and spoken instructions are ignored.

One of the solutions would therefore be to reduce the load of information directed at the pilot. Daniel Callan is a senior researcher at the NICT (National Institute of Information and Communication Technology in Osaka, Japan): "So the future cockpit is, hopefully, a non-invasive, brain machine interface, that would be able to monitor the pilot's attentional workload use countermeasures, through technology, perhaps a heads-up display, to present information to the pilot in the most optimal way and reduce the amount of information to the pilot optimally, so that under high workload conditions, it's only the situation that they need to deal with, (that's all) they need to attend to."

Since the Germanwings crash last March, pilots' behavior has been under scrutiny. However, researchers believe we are still a long way from switching to completely automatic, pilotless planes or even planes with just one pilot onboard.

"First of all, there is a psychological barrier - are passengers prepared to board an aircraft without a pilot? For now I would say that's a no. Having just one pilot on board, unfortunately we saw what happened with the Germanwings (crash), that can be a problem. So I think, there will still be two pilots inside the cockpit for a while to come," says Mickael Causse.

The potential of this research goes further as it could also be used during the pilot selection process and for monitoring the effectiveness of training techniques and cockpit designs.

And it could even be applied to others working in high stress jobs, like surgeons, or for people working in nuclear power control.

Airbus Orders Checks of A400M Software

Airbus is ordering engine software checks on A400M military aircraft after one of the four-engine turboprops crashed in Seville, Spain, on May 9 during a test flight, killing four of the six on board. According to a Reuters report, Airbus found data from the crash indicating a possible problem with the installation of the system that runs the engines. The company issued an alert to military agencies using the carrier aircraft, asking them to check the “electronic control units” that control the engines.The A400M that crashed hit an electrical tower during an emergency landing attempt. The accident remains under investigation and information from the flight data recorders hasn’t been released by the Spanish government. "The cause of the crash will only be discovered if Airbus's findings are being matched with the data from the flight data recorder," an unnamed military expert told Reuters. The turboprop was produced as part of Europe’s biggest defense project, costing $22 billion. The aircraft went into service in 2013, three years behind schedule.

Marine pilot buys a Harrier jet so he can keep flying after retirement

Some senior citizens retire to Florida. Marine Lt. Col. Art Nalls retired to the cockpit of his privately-owned **AV-8B Harrier** "jump jet."

Once a naval aviator and test pilot experienced in roughly 65 different types of aircraft, Nalls made a fortune in the real estate development business after he left the service. But he never forgot his love of flying or the first aircraft he flew in the Marine Corps - the Harrier.

BroBible writes:

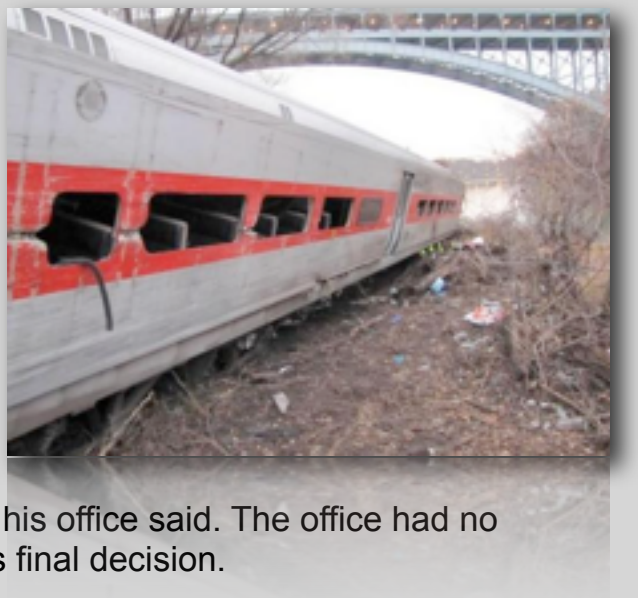
After attending an air show and rediscovering his passion for flight, Art purchased a Russian Yak 3 (Yakovlev Yak-3), only to soon realize that the enormous Soviet Star on the plane wasn't exactly attracting the eyeballs at airshows. What the people wanted to see were our nation's greatest planes. He noticed that the biggest star at any airshow was the Harrier Jump Jet, so beginning in 2010 Art Nalls began his quest to own one himself. Everything finally came together after discussing the possibility of owning one with the FAA (and receiving approval), and then finding a British Harrier Jump Jet for sale after Great Britain took them out of commission.

Although the video doesn't mention the price he paid, the going rate for a Harrier is around $1.5 million. Then of course there's the insane price of gas, which Nalls makes up by performing at air shows.

Check out this awesome video from AARP:

http://r20.rs6.net/tn.jsp?f=001ZKixHsH_D9xBqaCwujfEKF1GAA-YiiDVW_uYG6G1x767M1OSMC7WIC4uYcj9PjnsZUNV4xIKnUWzdYq4x6R3fRJPtoFDCJ6AviH7nof7Ptes2WEvPmKkJUy4DIZxehLVzC6ms6uCev4iPkT2Z6zhmEsma9vpaBqHf0QsWPPDw1Be0CX6YJazTo0XCbWtohY89jcvGFh7wjI=&c=hdvxeQnNqhbXRNwyVlmjZGvZuqM1bNpIHcoS0weaTIzy9sz_fY0Iig==&ch=aoKI-fFR5qntlpsleP6SHBmZIQhYaUG_tsI7573_lw6zS5a4A6LrAw==

No Criminal Charges Against Sleep-Deprived Engineer in 2013 Deadly Metro-North Derailment: Prosecutors



The sleep-deprived engineer who nodded off at the controls of a Metro-North train just before taking a 30 mph curve at 82 mph, causing a derailment in the Bronx in 2013 that killed four people and injured more than 70 others, will not face criminal charges, prosecutors said Thursday.The decision not to charge engineer William Rockefeller in the deadly crash had been expected.

Bronx District Attorney Robert Johnson made the decision weeks ago, his office said. The office had no comment on the delay in announcing his final decision.

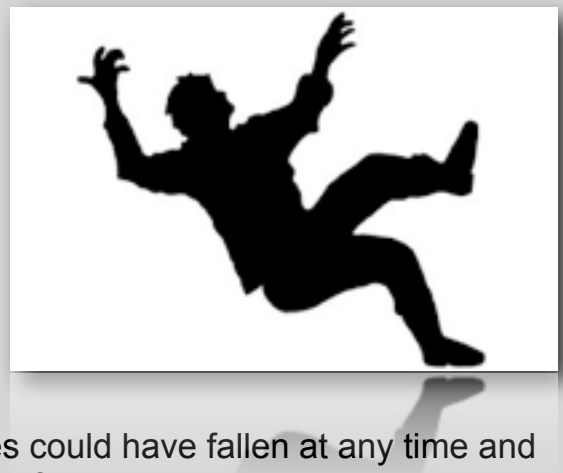
Rockefeller's sleepiness was due to a combination of an undiagnosed disorder — sleep apnea — and a drastic shift in his work schedule, the National Transportation Board determined. The agency said the railroad lacked a policy to screen engineers for sleep disorders, which contributed to the Dec. 1, 2013 crash. According to the NTSB, had a system been in place to automatically apply the brakes when an engineer nods off, the crash would have been avoided.

The acting head of the NTSB at the time the report came out called the deaths and injuries "preventable," and politicians, including Sen. Richard Blumenthal, the Democrat from Connecticut, slammed the MTA, which runs Metro-North, and said it had "blood on its hands."

Reached by phone Thursday, Rockefeller's attorney, Jeffrey Chartier, said he hadn't been notified about the decision not to file charges against his client. In response to NBC 4 New York's report, he commended the district attorney's office for the "thoroughness of their investigation and for coming to the same conclusion as the NTSB that there's no criminality on the part of Mr. Rockefeller."

OSHA Inspectors Spot Workers in 'Clear and Present Danger'

The roofing contractor has a history of similar violations and faces $72,800 in fines, according to the agency.



OSHA inspectors were driving back to their Providence office after completing an inspection when they saw two men on a ladder-jack scaffold without guardrails and no protective gear to keep them from falling 16 feet to the ground. The inspectors proceeded to pull over and begin another inspection."This was a clear and present danger. These employees could have fallen at any time and been killed or disabled. Ivan Paredes knew of this hazard but chose to ignore it and his legal responsibility to protect his employees," said Patrick Griffin, OSHA's area director for Rhode Island.

The two men were working for Ivan Paredes, a Brockton, Mass., roofing contractor. OSHA cited him for a willful violation of worker safety standards, as well as a serious violation.

"Fortunately, most employers know and obey the law. Many of them will show their commitment to worker safety during the National Safety Stand-Down from May 4-15. We encourage Rhode Island employers to join others across the country in this voluntary but vital effort.

Fuel cost, fuel safety

Thanks to a huge cut in the price of crude oil, fuel prices have been falling – and this is good news to aircraft operators. However, Avgas 100LL continues to be sold at a premium over motor fuel and many people continue to ask why there is such a difference in price.

So what is it that differentiates avgas from mogas – and why is Avgas 100LL so costly? Pilot put this, and other questions to aviation industry expert Sam Crooks, who has almost forty years' experience in the industry and is Operations and Technical Manager at Gulf Aviation, a part of Certas Energy. 'Avgas 100LL is highly refined, with specific octane ratings to make it resistant to detonation. Mogas is less refined, with a lower octane rating meaning it has a higher volatility, a lower ignition and flashpoint temperature. More prone to vapor lock in fuel lines compared to avgas, the motor fuel also restricts pilots to a maximum flying altitude.'

Sam has reservations about the use of mogas in aircraft. 'There has been a long raging debate on the use of mogas over Avgas 100LL within the general aviation industry. Designed for use in automotive vehicles, mogas being used as fuel for aircraft is a contentious issue, as the two fuels are refined and supplied in very different ways.

'The difference in cost between the two is down to the fact that Avgas 100LL is produced to higher specification and with far greater quality control than mogas. Another contributing factor to the higher cost of 100LL is that it is manufactured in smaller quantities and is not produced in the UK, so has to be imported.

'Regulatory standards are designed to ensure all aviation fuel is fit for purpose, meeting the aviation industry's expectation of good clean fuel reaching the aircraft engines. Contamination within the fuel supply chain is a very real threat, making it essential for all processes to be adhered to in order to ensure the products are free of contamination. Choosing the right fuel for your aircraft and being confident that it has passed the correct quality control procedures is essential to maintaining flight performance as well as safety.'

Sam is keen to ensure pilots are aware of the safety implications of poor fuel management at all levels of the fueling process: ‘Poor maintenance of aircraft, pilot experience and weather conditions are perhaps more obvious factors, but poor fuel management can cause huge issues for pilots. The regulations state that everyone involved in the process must take responsibility for fuel’s quality. For their part, the major fuel suppliers offer training courses for anyone involved in the handling.

‘Pilots should also take measures themselves to check fuel quality by sampling fuel tanks during preflight checks. In the remote chance fuel has been improperly managed, this is the last point at which any possible contamination can be discovered.’

What about the issue of storage? The throughput of airfield tanks and pumps can be very low at times−especially the winter months−and aviation fuel can sit around for extended periods. ‘There has been much discussion on how to handle avgas that has been stored for longer than six months. The product should be re-tested in a laboratory every six months to ensure it still meets specification; particular attention is given to its vapor levels.’

Finally, is there any prospect for reducing the cost of aviation fuel? ‘While crude oil prices are falling, there is a delay to this impacting on the price of refined products such as Avgas 100LL. In addition to this, most refined products are bought on lagged pricing which also explains why there are delays in it feeding through to the end user. Avgas 100LL also contains the component tetraethyl lead which is not linked to crude oil prices.’

Will the present trend continue? ‘Although predicting the prices of fuel is a risky business, the current supply and demand differentials don’t indicate that there will be any significant rises in 2015. That said, geopolitical risks in oil producing regions remain and these have the potential to significantly impact the market.’

Sleeping more isn't the key to feeling better at work

New study sheds light on who gets the best sleep around the world

Wage disparity isn’t the only gender gap separating men and women.

It turns out men also generally wake up in a better mood than women. At least according to a new report from Sleep Cycle, the alarm clock app that analyzes users’ sleep patterns.

The report, which draws on data from nearly one million Sleep Cycle users in 47 different countries, found that men wake up in a better mood than women in all but three countries: Colombia, Portugal and Ukraine.In the U.S., though, that good mood doesn't always follow more sleep. Sleep Cycle found that women in the U.S. sleep more than men on average every day of the week. On weeknights, U.S. men sleep an average of 6 hours and 54 minutes, while women sleep 7 hours and 11 minutes. On weekends, women sleep 7 minutes longer than men.

Globally, Japanese men sleep the least at less than 6 hours per night on average. Men and women in Finland and the Netherlands get the most sleep compared with other countries.

Sleep and Workplace Safety

Jose Colon, MD, MPH, gives lectures to local businesses on the importance of sleep to employers and employees.

– For Employers:
Lower health care and disability costs
Enhanced employee productivity
Reduced absenteeism
Reduced presenteeism
Decreased rates of illness and injuries
Improved employee morale
Increased organizational commitment and creation of a culture of health

http://paradisesleep.com/sleep-and-workplace-safety/

You are when you eat

Study may help explain increased risk of diabetes in shift workers

A new study may help explain why glucose tolerance — the ability to regulate blood-sugar levels — is lower at dinner than at breakfast for healthy people, and why shift workers are at increased risk of diabetes.

In a highly controlled study of 14 healthy individuals, a team led by researchers from Harvard-affiliated Brigham and Women's Hospital (BWH) measured the independent influences that behavioral factors (mealtime, sleep/wake cycle, and more), the body's internal clock (circadian system), and misalignment between these two components had on a person's ability to control blood-sugar levels. The team reports its findings — with implications for shift workers and for the general public — in the week of April 13 in PNAS."Our study underscores that it's not just what you eat, but also when you eat that greatly influences blood-sugar regulation, and that has important health consequences," said co-corresponding author Frank Scheer, Harvard Medical School (HMS) associate neuroscientist and assistant professor of medicine in the Division of Sleep and Circadian Disorders and Departments of Medicine and Neurology at BWH. "Our findings suggest that the circadian system strongly affects glucose tolerance, independent from the feeding/fasting and sleep/wake cycles."

In the new study, led by Scheer and co-corresponding author Christopher Morris, an HMS instructor of medicine at the Division of Sleep and Circadian Disorders, participants took part in two protocols. In the first, the participants had their first meal of the day ("breakfast") at 8 a.m. and their last meal of the day ("dinner") at 8 p.m. and slept at night. In the second, their schedules were reversed by 12 hours, with breakfast at 8 p.m. and dinner at 8 a.m., and they were scheduled to sleep during the day. The meals themselves were identical.

The research team measured levels of glucose and insulin at 10-minute intervals after each meal and hourly throughout the full sleep/wake cycle, among a number of other hormones.

The team found that glucose levels after identical meals were 17 percent higher (i.e., lower glucose tolerance) in the evening than in the morning, independent of when a participant slept or had their meals. They also found that simulated night work (sleeping during the day, having breakfast at 8 p.m., etc.), lowered glucose tolerance throughout multiple days. This phenomenon, which the researchers refer to as "circadian misalignment" may have important implications for shift workers.

"These two effects appear to be mediated, at least in part, by two different insulin-related mechanisms," said Morris. A circadian-regulated drop in early phase insulin response (as a measure of pancreatic beta-cell function) appeared to explain, at least in part, the difference between in glucose tolerance in the evening and in the morning. Circadian misalignment, on the other hand, was associated with signs of decreased insulin sensitivity but no disruptions in early phase insulin response. The researchers hypothesize that conflicting signals from the body's central internal clock and the behavioral cycle to various organs, such as the liver and pancreas, may contribute to these effects of misalignment on glucose control.

The new work may help the team and others develop and improve strategies for controlling glucose levels in day-active people and night workers. In addition to considering the roles of diet and exercise, some groups are pursuing drugs that may help regulate blood sugar levels in shift workers. Scheer, Morris, and their colleagues are focusing on the role of meal timing.

"Because night work will never disappear, we're investigating whether it's possible to schedule food intake to occur at more advantageous times," said Scheer, who is also the director of the Medical Chronobiology Program at BWH. "By better understanding the key factors that contribute to changes in glucose tolerance, we may be able to find better strategies to help mitigate the risk of diabetes for shift workers."

10 Basic Lessons from the U.S. Navy Seal Training Program.

The following are the remarks by Naval Adm. William H. McRaven, ninth commander of U.S. Special Operations Command, at the University-wide Commencement at The University of Texas at Austin on May 17:

If you make your bed every morning you will have accomplished the first task of the day. It will give you a small sense of pride, and it will ...

https://www.youtube.com/watch?v=pxBQLFLei70