

Aviation Human Factors Industry News

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From the sands of Kitty Hawk, the tradition lives on.

Hello all,

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

★Asiana pilot 'very stressful' prior to San Francisco crash

★Emus on runway likely cause of Cessna's outback crash landing at Honeymoon

★Fatigue cracking found in crash plane

★Runway Incursion at Farmingdale Provides Important Lessons

★FAA Proposes Fines Against Great Lakes Aviation, Southwest Airlines

★Norwegian near-stall to spur 737 modification

★Family Reaches Settlement In 2011 Cessna Accident In Mississippi

★And Much More

Asiana pilot 'very stressful' prior to San Francisco crash

The pilot at the controls of a South Korean airliner that crashed in San Francisco in July said he felt "very stressful" about making a [non-instrument landing](#), according to documents made public Wednesday.

Three passengers died when Asiana Airlines Flight 214 clipped a seawall with its landing gear, skidded out of control and burst into flames at the tragic end of an otherwise routine flight from Seoul on July 6. Another 182 passengers and crew aboard the Boeing 777 were injured, in the first fatal commercial airline crash in the United States since 2009.

A summary of Captain Lee Kang-Kok's interview with air accident investigators was released Wednesday at the start of a day-long public hearing by the National Transportation Safety Board (NTSB) in Washington.

"We have the opportunity today to ensure that the lessons of this tragedy are well-learned and that the circumstances are not repeated," NTSB chairwoman Deborah Hersman said, opening the day's proceedings.

According to the written NTSB summary, Lee told investigators he felt "very stressful" about making a visual approach into San Francisco, where the instrument [landing system was down for servicing](#) on an otherwise perfect summer day.

"Asked about whether he was concerned about his ability to perform a visual approach, he said, 'Very concerned, yea'," the summary said.

"Asked what aspect he was most concerned about, he said 'the unstable approach' -- [the ability to set up an airplane for landing at a precise speed, direction and rate of descent](#).

"He added, 'exactly controlling the descent profile and the lateral profile, [that is very stressful](#)'."



A non-smoking father of two who jogged daily and favored yellow rice and vegetables for his meals, Lee had flown Airbus A320s for Asiana from 2005 until February this year, when he began training to transition to the bigger Boeing 777.

He had 9,700 hours of flight experience, [but only 35 hours](#) in the Boeing 777.

In the co-pilot's seat was Lee Jung-Min, a flight instructor for Asiana and former South Korean fighter pilot with considerable experience flying the Boeing 777.

Prior to San Francisco, Lee Kang-Kok had made four round-trip training flights in the "triple seven" -- to Los Angeles, London and twice to Tokyo.

Earlier in his career, he told investigators, he had twice landed at San Francisco, once manually, as a co-pilot of an Asiana Boeing 747.

Bill English, the NTSB investigator leading the Asiana probe, said the autopilot was switched off about three miles from the runway, and that the airspeed eventually dropped to 103 knots, or 34 knots below the desired final approach speed.

NTSB spokesman Keith Holloway said a final report into a major accident typically takes a year to complete. "This is just one phase, a fact-gathering stage," he noted.

None of the four pilots, 12 flight attendants and 291 passengers, many of them South Korean and Chinese nationals, were scheduled to testify in person.

Instead the hearing at an NTSB conference center in Washington had lined up sworn expert testimony on such issues as cockpit automation in the Boeing 777 and the training of Asiana pilots in its operation.

It was also set to dwell on the [effects of automation on pilot performance](#) in the moments prior to an accident, airport emergency response and the crashworthiness of aircraft interiors.

Retired Boeing test pilot John Cushman said the aim of cockpit automation was ["to aid the pilot, not replace the pilot,"](#) who at all times remained the final decision-maker in every stage of a flight.

Asiana has defended the two pilots at the controls at the time of the July 6 accident, Lee Kang-Kuk and Lee Jung-Min, saying they were "competent" veteran aviators whose experience included dozens of flights to and from San Francisco.

It also said in July that "there were no engine or mechanical problems" on the aircraft, which it acquired in 2006.

Emus on runway likely cause of Cessna's outback crash landing at Honeymoon

A pilot who crashed at an outback airstrip with the landing gear retracted was probably [distracted by emus](#), an accident report has found.

The Cessna 441 pilot was making his third trip for the day between Adelaide and the outback Honeymoon mine area in the far north of South Australia.



There were eight passengers on board when the aircraft crash-landed, in early September, and none was injured despite the belly landing. The Australian Transport Safety Bureau says the pilot had noticed emus on the runway while [making his landing checks and somehow forgot](#) to engage the Cessna's landing gear.

It says a horn which usually warns of such a failure [did not sound](#).

The bureau says the incident highlights the danger pilots can face from distractions, especially at a [critical stage of flights](#).

It says research by the bureau has found 13 per cent of accidents between 1997 and 2004 could be attributed to pilots [getting distracted](#) during the approach stage of their flights.

It urges pilots who get distracted during their check list stage [return to the start of the list](#) to reduce the likelihood of making a mistake.

Fatigue cracking found in crash plane

Air safety investigators have found "fatigue cracking" in an aircraft that crashed after one of its wings fell off while it was water-bombing bushfires near Ulladulla.

The pilot, David Black, 43, died when the fixed-wing M18 Dromader crashed in rugged terrain about 37 kilometres west of Ulladulla on October 24.



The husband and father of three young children was from Trangie in central NSW. The pilot had been involved in a firebombing mission in the Budawang National Park with another aircraft and a support helicopter in weather that was described as "okay".

The helicopter crew had watched as the Dromader make a "broad, descending left turn" on to a flight path that followed a ridge line about 100 feet above trees towards the intended target.

But disaster struck when the aircraft's left wing separated as it rolled level, sending it into a dive leftwards and resulting in it crashing into the bushland.

In a preliminary report released by the Australian Transport Safety Bureau on Monday, investigators found that the wing had separated at an attachment joint about six metres from the wing tip.

A preliminary examination of the fittings indicated that a part of the wing had fractured in an area where there was "pre-existing fatigue cracking".

Investigators said the "fatigue cracking" reduced "the structural integrity of the fitting to the point where operational loads produced an overstress fracture".

It is the fourth fatal accident in Australia involving an M18 Dromader aircraft since 2006, and the second in which there was an "in-flight break up".

Following the spate of earlier accidents, the ATSB released a report in April that found a range of safety issues arose when Dromader aircraft were flown at take-off weights above 4.2 tonnes.

In the wake of the crash, the Civil Aviation Safety Authority last month grounded all 29 M18 Dromaders operating in Australia, and later directed operators of the aircraft to conduct more regular inspections.

The M18 Dromader involved in the crash near Ulladulla was operated by Rebel Ag in Trangie, and had been contracted to the Rural Fire Service for firefighting efforts.

As a result of the investigation earlier this year, Rebel Ag told the bureau it would make a raft of modifications to its aircraft, including fitting vortex generators on their wings.

The ATSB's final report is not expected until late next year, and will include the outcome of investigations into the history of the aircraft's operations and maintenance.

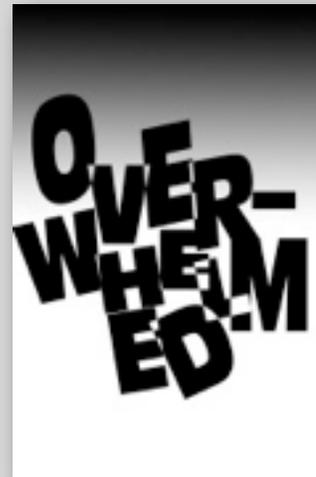
Runway Incursion at Farmingdale Provides Important Lessons

Two Part 91 business aviation pilots departing New York's Farmingdale Airport on a recent IFR flight during gusty, rainy conditions became involved in a runway incursion that presented a [number of valuable lessons](#).

According to an Aviation Safety Reporting System filing, the pilot taxiing a Cessna Citation Sovereign for departure was first issued the clearance "Runway 19 via Bravo and cross Runway 14" by ground control. The pilot checked the airport chart on his iPad and the other pilot acknowledged the clearance as the crew [struggled to engage the jet's rudder lock](#) in wind exceeding 25 knots. However, as the wind changed, so did the departure runway, to 14. One pilot taxied while the other tried to load the new departure runway in the FMS, but the system refused to accept it because of the wind strength. Then the cockpit [became busier](#) as another wind change brought a change of the active back to Runway 19.

At this time the Citation's crew alerting system began generating alternating fail messages as the angle-of-attack indicator rapidly fluctuated. Then the crew heard an ELT signal and thought it might be their aircraft, [causing another distraction](#) that they tried to clarify as they continued taxiing.

In all the confusion the crew mistook Runway 19 for 14 and were beginning to cross it when the ground controller stopped them.



The pilot taxiing later realized he should have stopped the airplane much earlier [and solved the problems](#) rather than continue taxiing. Multiple runway changes while trying to control the aircraft in the gusty wind only made the situation worse. He also admitted later that some of the [airport's signage was confusing](#) and that he should have requested clarification.

FAA Proposes Fines Against Great Lakes Aviation, Southwest Airlines

Both Allegedly Violated FARs Relating To Maintenance

The FAA has proposed fines against two U.S. carriers related to alleged violations of maintenance procedures.

The agency is proposing a \$325,000 civil penalty against Dallas-based Southwest Airlines for allegedly operating an aircraft that had been [improperly modified](#). On Aug. 29, 2011, maintenance personnel improperly installed a switch that enables flight crews to test the windshield heating system on a Boeing 717 that AirTran Airways Inc. was operating. Southwest is in the process of merging with AirTran. Proper installation of the switch would have allowed personnel to isolate the windshield anti-ice system that was causing a warning that the windshield heater was failing. [Instead, the center and left windshield warning systems were reversed](#). The right windshield warning system continued to operate properly. The aircraft was operated on 1,140 passenger flights before the problem was corrected.



A \$304,000 civil penalty has been proposed against Great Lakes Aviation of Cheyenne, WY., for allegedly conducting 19 flights with aircraft that were not in compliance with FARs.

Great Lakes operated the aircraft in conditions in which the carrier could reasonably expect frost, snow or ice to adhere to the planes, the FAA alleges. The FAA maintains that Great Lakes flew Beech 1900 aircraft out of Hays, KS, in January 2011 with [deicing fluid that exceeded the maximum temperature of 180 degrees Fahrenheit](#). The Great Lakes deicing manual states that fluid heated to more than 180 degrees could damage the aircraft or the deicer.

Both airlines have 30 days from the receipt of the FAA's enforcement letter to respond to the agency.

Norwegian near-stall to spur 737 modification

Boeing is to modify 737s to improve protection against potential freezing of elevator systems, after investigation into a near-stall by a Norwegian aircraft highlighted the risk of de-icing fluid contaminating power control units for the horizontal stabilizer.



The investigation into the 737-800 incident, on approach to Kittila in Finland, has already resulted in Boeing changing de-icing procedures on the type. Under the new procedures the trim is set to take-off position, rather than fully-forward, and de-icing fluid is applied at an angle, not directly from the side.

While the cause of the incident is still being explored, Norwegian investigation authority SHT demonstrated that de-icing fluid was capable of entering the tail cone in “quite considerable” amounts. “Under certain circumstances it is possible that the input arms [to the power control units] may be exposed to fluid which in turn freezes solid and blocks [them],” says SHT, adding that Boeing was “not aware” of this potential problem before the investigation.

Examination of Norwegian’s fleet revealed that there had been similar fluid ingress into other 737-800, as well as 737-300, aircraft.

Boeing has also simulated a comparable restriction of the power control unit arms, by de-icing fluid, in a cold-chamber rig.

The aircraft (LN-DYM) involved in the Kittila incident had been delivered new to the carrier in 2011.

It had been de-iced before the flight from , Helsinki, on 26 December last year, in temperatures of minus 17C.

At a height of 3,250ft during approach to Kittila runway 34 – with its autothrust and autopilot engaged – the aircraft's began to pitch up in line with a nose-up trim actuation. To counter the resulting loss of airspeed the autothrust commanded full power, but this led the pitch to increase and the airspeed to bleed away rapidly.

Analysis shows that both the primary and secondary input arms on the right-hand power control unit **were blocked** when the autopilot “unintentionally” elevated the nose of the aircraft, says SHT.

When the 737 reached 20° nose-up the pilots began pushing with “full force” on their control columns, it states. Flight-data recorder information shows they applied a combined 920N (207lb) of force in a bid to stop the jet climbing.

The pitch increased to 38.5° and airspeed fell to 118kt – activating the stick-shaker and generating a stall warning. Although this was below the 121kt stall threshold, lower wing loading meant a stall was averted.

SHT says the pilots' efforts managed to bring the nose down. But it notes that, during the initial ascent, there was “**no attempt**” to disengage the autopilot, autothrust or manually adjust the stabilizer trim to nose-down.

“**One or more of these measures would have improved the situation,**” it says, and also suggests that the control column force should have disengaged the autopilot automatically.

The aircraft subsequently landed safely after a 30min hold for the crew to conduct a systems check.

Examination of the power control units found traces of dried de-icing fluid, although the units passed all function tests and met specifications. There was no indication of internal component abnormalities.

SHT says it is looking into error codes, regarding automatic Mach trim, from one of the two flight control computers of the aircraft – although it points out that the other computer had been engaged during the approach, and passed all function tests.

Boeing has informed the investigators that it plans to modify all 737 to achieve “better protection” against the risk of the elevator system “freezing solid”, says SHT. The authority says it plans to release a related safety recommendation, but stresses that it has yet to reach conclusions about the incident.

Family Reaches Settlement In 2011 Cessna Accident In Mississippi

Amount Awarded to The Family Of David Duncan Undisclosed

The family of David Duncan, who was fatally injured when the Cessna 310 he was flying went down following its annual inspection, has been awarded an undisclosed amount to be paid by the Tupelo, MS Airport Authority. The Daily Journal of Northeast Mississippi reports that state law caps such against government entities at \$500,000. According to the NTSB's probable cause report from the accident, the airplane had just



undergone an annual inspection, at which time the left engine's number two cylinder was replaced. In order to facilitate the cylinder replacement, the B-nut attaching the fuel supply hose to the engine's manifold valve was removed and reinstalled. A post maintenance engine ground run was performed, and no discrepancies were noted. The airplane was cleared to depart from runway 36 with an easterly departure. Witnesses observed the airplane roll down the runway, liftoff, and at an estimated altitude of 300 to 500 feet above the runway, about mid-field, witnesses observed the airplane turn to the left on a west heading and descend. Witnesses heard a loss of engine power just before the turn. The airplane impacted the adjacent main road, and all three of the landing gear separated. The airplane struck a vehicle and a tree before its nose section impacted the base of a 3-foot diameter tree in the front yard of a house and then came to a stop. Post accident propeller examination revealed that both propellers were in a low pitch position; the right propeller impacted while operating at high power, and the left was operating with low power or was windmilling at time of impact.

The on-site wreckage examination found that the B-nut connecting the fuel supply hose to the manifold valve on top of the left engine had backed off about a quarter turn. The B-nut was tightened, and both engines were test run after the accident; no abnormalities that would have prevented normal operation were found. Both engines produced production-rated power. After completion of the left engine test run, the B-nut between the fuel supply hose and the manifold valve was set at finger-tight torque.

A wire was attached to loosen the B-nut during the engine run, and a stop was in place to limit the rotation. The engine was started and set at full throttle and [the B-nut was loosened to slightly over a quarter turn](#). When the B-nut was loosened, the engine immediately lost power. It is likely that the B-nut had been tightened sufficiently to maintain torque during the ground run; however, [the vibration](#) of extended engine operation during takeoff led the B-nut to back off, resulting in the loss of power in the left engine.

From the position where the witnesses reported hearing the airplane lose engine power, about half the runway (or about 3,200 feet) remained. In addition, an open field was located past the departure end of that runway. However, the airplane turned left after the loss of engine power, which [was contrary to the departure instructions and contrary to the safest option for an emergency landing](#) (the remaining runway or the open field). Further, the propeller blades were in the low pitch position, indicating that the pilot [didn't perform the engine failure checklist](#), which stated that the propeller should be feathered. Thus, it is likely that the pilot was delayed in his reaction to the sudden loss of thrust from the left engine and could not maintain airspeed or straight ahead flight.

The National Transportation Safety Board determined the probable cause of this accident to be the pilot's [delayed reaction](#) in performing the engine failure procedures and his failure to maintain adequate airspeed, which resulted in a loss of airplane control. Contributing to the accident was maintenance personnel's [improper torquing of the B-nut](#) between the fuel supply hose and the manifold valve.

Bombardier Safety Standdown 2013: Creating a Safety Culture

Aviation “[safety's in a rut](#),” Dr. Tony Kern told attendees at the Bombardier Safety Standdown in Wichita this fall. The key to getting out of that rut, he said, is to make pilots realize they [can't rest on today's safety record](#). Kern is the CEO of Convergent Performance, a Colorado-based [human-performance](#) consulting company, and the author of seven books on human performance.



Kern believes that two decades of [social engineering](#) focused on making everyone believe they are as good at everything as everyone else has led to a climate in which no one really expects anyone's best efforts. In a safety-focused industry like aviation, that attitude can get people killed. "[Look at our check-ride system,](#)" he said. "Almost no one fails a check ride anymore. Is it because everyone has become such a great pilot?"

Kern expressed concern that people have lost that gut feeling that warns us when something's not right, even though we may not be able to clearly identify the threat. He worries that pilots often ignore those gut feelings and need to focus on a deep awareness of the flying environment—first [self-awareness](#) and then [situational awareness](#)—he said. "I don't know what the Asiana guys were thinking about as they approached San Francisco. But I can tell you they weren't focusing on altitude and airspeed," Kern said. [Deep awareness asks questions like,](#) "What am I thinking about right now?" and "What should I be thinking about right now?" and "Why am I not thinking about what I should be right now?"

The coming "big crew change," the exodus of much of the experienced pilot population from the workforce in the next five years, will create an [experience vacuum](#), and someone needs to mentor new aviators, said Kern. "You can deny your weaknesses, or you can simply admit them. If we deny them, they will hurt us. At least if we admit them we have a chance to improve things for everyone."

Awareness of the environment includes being prepared for dangers that have not been identified yet, said Kern. "We recognized the dangers in authoritarian captains years ago. That created [crew resource management systems](#). Then there was wind shear. We've learned to successfully adapt to these threats. But what are we not adapting too? Sure there's the changing automation landscape. What we fly with in five years will probably make what we're using now look primitive. There's NextGen airspace, the big crew change and a wildly fluctuating economy." Kern believes we also waste a valuable resource: a review of all the tasks we routinely perform. "We need to learn to embrace change with a big bear hug. If we don't, there's someone else around you who will."

Kern says too many people believe the FAA will come out with a new rule that will change the standards if we need to improve. [He says it's our responsibility.](#) "Check for [your own] competence, train for excellence, practice precision and picture perfection. That will put you in touch with the natural cycle of excellence."

The ROI of Safety at DuPont – Part II

Integrated Safety Structure

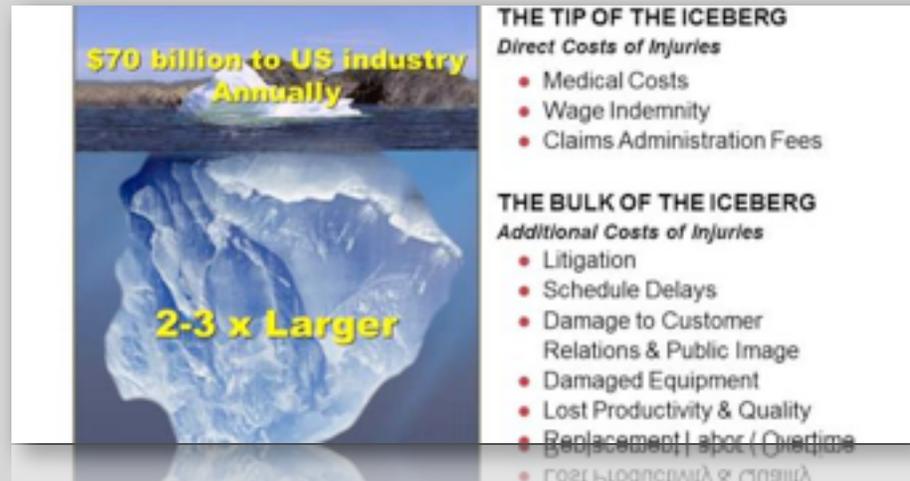
A strong safety culture engages all employees. This requires the company's safety organization to deploy people strategically throughout the organization. Traditionally, many companies have employed safety

professionals or established entire departments to which safety was effectively outsourced. More "safety" than engaged participant and often out of touch with the real challenges of safe production, these safety professionals end up with an unenviable and unviable task. One of the earliest principles established by DuPont's founding fathers was that line managers should be responsible for the safety of the units they were operating. The supporting safety professional then becomes expert, mentor, and guide to the line organization. An effective safety organization also produces data -- lots of it -- measuring both past performance and leading indicators (future). It develops strategies, is open to new ideas, and takes corrective and proactive actions. To do this, both line managers and safety professionals need to set up integrated managing structures to ensure the data are interpreted and used to drive change and that actions are agreed upon, assigned, and completed. The most effective organizations form committees or teams that are dynamic and productive groups working effectively to improve performance.

Processes and Actions

Even with strong leadership and an enabling structure in place, organizations must act to be effective. Organizations with a strong safety culture share certain action-oriented practices that include:

- Ongoing development programs that transfer knowledge and skills that help employees recognize unsafe situations, correct them, and work safely;



- Comprehensive audit programs with second- and third-party participants to proactively identify gaps in their processes to help ensure the safety culture remains strong and is embraced by the organization;
- Effective communication programs that keep safety top of mind throughout the organization; and,
- Both reactive and proactive processes to analyze and prevent safety incidents. For example, incident investigations help organizations learn from what has happened, while regular safety observations help prevent what might happen. In both cases, the key is to socialize the findings and show strong discipline in implementing recommendations.

Measuring the ROI

The return on investment that results from developing a strong safety culture includes returns that are relatively quantifiable (direct costs saved) and those that are less easily quantified (indirect costs avoided from loss of production, quality losses, equipment damage, etc.). The size of direct costs depends in part on the regulatory framework in which the organization operates, but indirect costs apply everywhere. Direct costs alone are often enough to justify investments in safety improvements. The iceberg illustration showing direct and indirect injury costs applies to all organizations, although proportions may change.

However, focusing exclusively on the benefits of avoiding incidents does a disservice to well-run safety organizations. Engaged leadership, the ability to diagnose issues and act preventatively to correct them, and the supportive and collaborative nature of an interdependent safety organization spill over into broader organizational effectiveness. Dividends include stronger operational discipline, greater productivity, an improved risk profile, and higher employee morale.

Momentum Is Key

Sustaining a safety culture transformation requires a plan that keeps safety alive and fresh across the organization, and it often takes time. Otherwise, the accomplishments may be temporary.

A successful safety plan should take into account employee turnover and leadership changes, maintain operating discipline, provide for continued audits, monitor data, report progress or slippage, and reinvigorate structures with carefully planned staff transitions. And finally, organizations should look for new challenges, such as off-the-job safety or community engagement, to keep the momentum going toward the goal of zero.

In the end, safety is about protecting people, their lives, and their livelihoods, but it is heartening to know that the better we get, the greater the rewards can be.

Aviation Plant Noted for Safety System

GE Aviation in Terre Haute has earned the [Voluntary Protection Program Merit Certification](#) for implementing safety systems that identify, evaluate, prevent and control occupational hazards to prevent employee injuries and illnesses.

GE Aviation in Terre Haute has earned the Voluntary Protection Program Merit Certification for implementing [safety systems](#) that identify, evaluate, prevent and control occupational hazards to prevent employee injuries and illnesses.

Rick Ruble, commissioner of the Indiana Occupational Safety and Health Administration, on Monday presented company officials with a large "VPP" flag and plaque for its work on making safety a workplace standard. "You are really part of an elite group," Ruble told a gathering of GE employees.

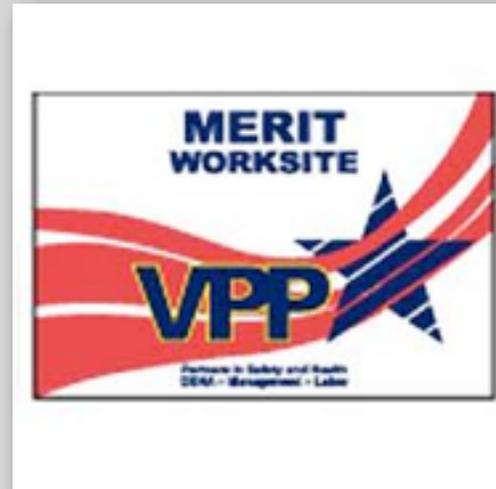
GE Aviation combined its two plants in Terre Haute under one umbrella in 2012. The company's plant No. 1, formerly GE Tri-Remanufacturing at 3390 Locust St., was the first star VVP award recipient in Terre Haute in July 2000. Star is the highest designation in the VVP program.

GE Aviation employs 450 workers, with 85 at its plant No. 1 and 365 employees at plant No. 2 at 333 S. Third St. in Terre Haute.

Tom Bradley, site leader for GE Aviation in Terre Haute, said GE plans to invest \$1 million in 2014 to [increase environmental health and safety](#) at its two Terre Haute plants on items such as fire upgrades, chemical management, dust collection, machine guarding and safety improvements on cranes and hoists.

"I would consider the plant upgrade we are working on now [at plant No. 2] partly environmental health and safety. If you walked through this plant two years ago and walked through it now, it is safer today just because it is brighter, more well-kept and more organized," Bradley said after the IOSHA presentation.

Bradley said GE Aviation in Terre Haute has had double-digit growth in its production volume in 2013, and that 2014 will be another double-digit growth year.



"Our business is really strong in Terre Haute, which has a bright, bright future. Some of the product lines that we are investing in and growing on are strategic product lines that are going to last 10, 20 and maybe even 30 years, so the technology we are investing in is phenomenal," Bradley said.

Andy Hayes, GE's environmental health and safety leader, said 141 employees, about a third of the company's workforce, [were interviewed by the Indiana Department of Labor](#) to obtain the merit status, along with more than 1,100 safety inspections this year.

"We call it 'find it and fix it,' where an employee finds an issue, they take care of it on the spot," Hayes said. "[We empower the employees to do that.](#) Our goal was 600 for the year, and we completed 1,057, so we beat our goal like crazy. That is how engaged our employees are in lowering our incident rate."

Hayes said the company's 450 employees took a combined 6,500 safety training courses this year. "Our emphasis on training and making sure our employees get the information they need and have the skills is very high. Now we are going to push that to the next level," Hayes said.

The company has plans to achieve a "star" rating when it is re-evaluated in three years by IOSHA.

Young Adults More Likely to Take Risks After Sleeping Less

People ages [18 to 24](#) are more likely to undertake risky activities, such as having unprotected sex, driving under the influence, and taking drugs when sleep-deficient, finds a study from Australia. "The study found that when young people had [three to four hours less sleep](#) than usual, they had slower reaction times, were moodier and more impulsive," says author Kalina Rossa, a sleep with Queensland University of Technology's Centre for Accident Research & Road Safety-Queensland, in a release.

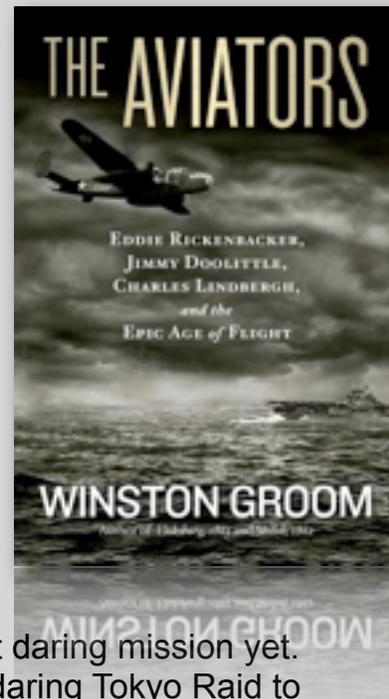


"If you put that into a Schoolies' context where young people who are going to be sleep-deprived as well as possibly under the influence of alcohol—it is really a double whammy—the risks are even higher." Rossa said while everyone needed a good night's sleep, young people might be particularly vulnerable because the decision making part of the brain **did not fully develop until the age of 25**, and this part was affected by the negative effects of sleep loss. "What this means is that the part of the brain that is responsible for problem solving and impulse control **changes** when we haven't gotten enough sleep, and because young people are still developing in this area, a lack of sleep may cause them to **make poor choices**," she says.

The Aviators - Book

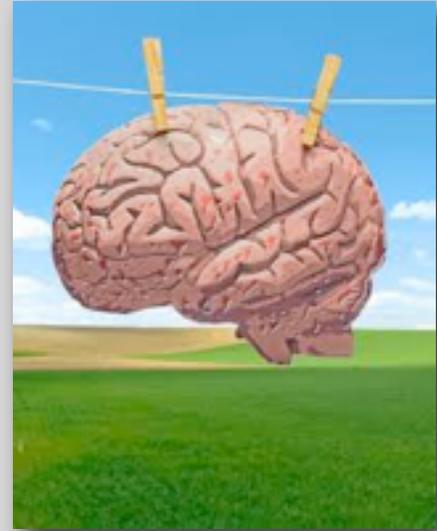
Written by gifted storyteller Winston Groom (author of Forrest Gump), *The Aviators* tells the saga of three extraordinary aviators--Charles Lindbergh, Eddie Rickenbacker, and Jimmy Doolittle--and how they redefine heroism through their genius, daring, and uncommon courage.

This is the fascinating story of **three extraordinary heroes** who defined aviation during the great age of flight. These cleverly interwoven tales of their heart-stopping adventures take us from the feats of World War I through the heroism of World War II and beyond, including daring military raids and survival-at-sea, and will appeal to fans of *Unbroken*, *The Greatest Generation*, and *Flyboys*. With the world in peril in World War II, each man set aside great success and comfort to return to the skies for his most daring mission yet. Doolittle, a brilliant aviation innovator, would lead the daring Tokyo Raid to retaliate for Pearl Harbor; Lindbergh, hero of the first solo flight across the Atlantic, would fly combat missions in the South Pacific; and Rickenbacker, World War I flying ace, would bravely hold his crew together while facing near-starvation and circling sharks after his plane went down in a remote part of the Pacific. **Groom's rich narrative** tells their intertwined stories--from broken homes to Medals of Honor (all three would receive it); barnstorming to the greatest raid of World War II; front-page triumph to anguished tragedy; and near-death to ultimate survival--as all took to the sky, time and again, to become **exemplars of the spirit** of the "greatest generation."



Sleep Washes the Brain

Why do people and animals sleep? This question has long puzzled scientists and sparked several competing theories. A new study on mice claims to have found the answer: **The brain physically cleans itself during sleep**, essentially running a nighttime rinsing cycle that flushes out toxins that build up during the day. “The brain only has limited energy at its disposal, and it appears that it must choose between two different functional states: awake and aware or asleep and cleaning up,” University of Rochester neurologist Maiken Nedergaard tells BBC.com. She found that during sleep, the cells in a mouse’s brain shrink dramatically, the space between them by some 60 percent. That allows cerebrospinal fluid to circulate more freely and wash away cellular waste. Upon waking, the brain cells enlarge and the flow slows to a trickle. Among the residue removed from the brain during sleep is **beta-amyloid**, a plaque-like substance that is a hallmark of Alzheimer’s. Nedergaard says it’s probably no coincidence that diseases associated with dementia are linked to sleep disorders, raising the possibility **that adequate sleep may be important** in slowing the progression of brain damage.



Inspiration

As air travelers brace for the annual holiday ordeal that awaits many of them, Canadian budget carrier WestJet had a **holiday miracle** in store for passengers on two of its flights earlier this week. The airline began by creating present-shaped check-in kiosks at Toronto and Hamilton, Ontario airports for two flights bound for its hub of Calgary, Alberta.



The kiosks featured a live online Santa in a blue suit (WestJet colors) who greeted them by name as they scanned their boarding passes. The Santa then asked them what they wanted for Christmas and that's when the real magic began.

By the time the doors closed on both flights, 175 WestJet employees in Calgary headed to a local mall and a Best Buy to gather up many of the gifts requested by the passengers including a big-screen TV, Thomas the Tank Engine and socks and underwear. The gifts were wrapped, tagged with the [passengers' names and put on the baggage carousel about four hours later when the flights arrived.](#)

Santa in the funny-colored suit was there, too. The idea was hatched in August at a meeting with the airline's digital media contractor but the giving didn't end in baggage claim. WestJet said that if the YouTube video below reached 200,000 views it would give a free trip anywhere it flies to a family in need. The video hit the magic number late Monday but who knows what the airline will do as the numbers rack up. (At press time, the video had already hit millions of views.)

http://www.youtube.com/watch?feature=player_embedded&v=zIElvi2MuEk

