

# Aviation Human Factors Industry News

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

Hello all,

To subscribe send an email to: [rhughes@humanfactorsedu.com](mailto:rhughes@humanfactorsedu.com)

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

★FAA's Aviation MX Human Factors Quarterly

★Your Certificate May Be On the Line for What You Don't Record

★FAA Says Avoid Drone Registration Schemes

★AOPA's Air Safety Institute Launches Focused Flight Review Program

★Connecting Dots Of Safety

★Ground crew to blame for fiery plane collision at Pearson in January, TSB says

★FAA Proposal To Address Rudder Reversal Load Concerns

★Engine Core Included in Bird-ingestion Testing Proposal

# Aviation Mx

## HUMAN FACTORS

**QUARTERLY**

### Human Factors in Aviation Maintenance



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**Dr. Bill Johnson**, a frequent contributor to this newsletter, is the FAA Chief Scientific and Technical Advisor for Human Factors in Aircraft Maintenance Systems. His comments are based on nearly 50 years of combined experience as a pilot, mechanic, airline engineering and MRO consultant, professor, and FAA scientific executive.



# Your Certificate May Be On the Line for What You Don't Record

by John Goglia

Listen up, my fellow mechanics. How you record maintenance work just got a **new focus**, thanks to a recent NTSB decision that presents a potential new enforcement danger to your certificate.

A May 11, 2018 decision by the NTSB reinstating the FAA's emergency revocation of a Part 145 repair station puts a **new emphasis** on maintenance record entries; specifically, what maintenance personnel **choose to leave out** of their descriptions of work performed could land them in very hot water. This decision doesn't affect only repair stations or corporate maintenance providers. It's clearly applicable to A&Ps, as well. The decision makes clear that **intentional falsification** can rest on information left out of the description of work performed, so-called **shortcuts** that many mechanics routinely take in recording maintenance. The case is so recent that it may yet be appealed to a federal court, so the final ruling could change. But in the meantime, the decision stands.

The AeroBearings case—officially, Daniel K. Elwell Acting Administrator, Federal Aviation Administration v. Kornitsky Group, LLC, d/b/a AeroBearings, LLC—involves the FAA's emergency revocation of the company's Part 145 repair station certificate for—among other things—**falsification of records**. I have a lot of issues with the case that was brought by the FAA and how it fits into the new “compliance philosophy.” It seems that the company was authorized by one set of inspectors to do what it was doing for five years.

The image shows a handwritten 'FLIGHT DEFECT AND MAINTENANCE REPORT' form, likely a Form 312, with various fields filled in and signatures. The form includes sections for flight information, maintenance actions, and a report section. The report section contains handwritten text: '1. REP. LAB LOGS ONLY INSIGNIFICANT', '2. PL'S P/B DOES NOT DIM SUFFICIENTLY', and '3. PL'S CASE DID INTERCHANGE FOUND DURING UNIT EXCHANGE THAT OTHER W/ PROBABLE DISCREPANCY SUGGESTS PL DID OR SOME NORMAL TO SYSTEM PL DID'. The form also has a date of '17 06 08' and a signature 'MKR 503'.

A new inspector—after receiving two hotline complaints—reviewed the company’s authorizations and determined the FAA [had been mistaken](#) in granted one of these authorizations.

The FAA reinspected the facility and, after 10 months, issued its report and handed the company an emergency revocation on the same day. Something seems unfair about all this and not consistent with the new compliance philosophy. Maybe more went on than is apparent from the initial and final decisions in the case. But it’s always disconcerting when the FAA claims a company is unqualified to do work, but lets it operate for such a long time, and then apparently does nothing to correct the work that was performed for years.

### OMITTED INFORMATION

According to the NTSB’s decision related to the issue of falsification (there were other regulatory violations cited that were related to the company’s authority to perform the work), the case turned on omissions made in [FAA Form 8130-3s](#) (Authorized Release Certificates). According to the FAA inspector who testified at the hearing, the “OEM manuals for the bearings in question did not authorize [AeroBearings] to disassemble bearings. He also testified that “[the company’s] 8130-3 certifications were false in that [they did not fully describe the work that had been performed.](#)” On cross-examination, the inspector admitted that the entries on the 8130-3 [were not false](#), but that they were “incomplete in that they omitted some information.”

The company’s witness testified that the final inspection certification was accurate and that work performed before the inspection—though not recorded—was authorized. The administrative law judge determined that the FAA had not met its burden of proving intentional falsification and reversed the sanction of revocation. (The ALJ did, however, find other violations and ordered an indefinite suspension of AeroBearings certificate.) On appeal, the full Board reversed the law judge and re-instituted the emergency revocation.

On the issue of falsification, the NTSB first reviewed its long-standing standard for determining intentional falsification: “[The \[FAA\] must prove the respondent](#) (1) made a false representation, (2) in reference to a material fact, and (3) had knowledge of its falsity.”

The NTSB has previously determined that omissions can constitute the first prong of this test (false representation) and that certain omissions can be determined to be “material”; that is, if they could “affect decisions inspectors, mechanics, or operators make concerning work on the aircraft.”

### INTENT TO FALSIFY

Previously, however, the Board has required the credibility of the maintenance personnel making the entry to be determined before concluding that the third prong of the test was met: that the person had knowledge of the falsity. This case makes new law in that regard. After dismissing the administrative law judge’s credibility determinations, saying they were arbitrary and capricious (in all my years on the Board, I can’t recall a case where a law judge’s credibility determinations were found to be arbitrary and capricious), the decision states: “This case provides the Board with an opportunity to expressly expand the Board’s ‘willful disregard’ standard...to mechanic intentional falsification cases.” [This means that a mechanic can be found to have intentionally falsified a maintenance logbook entry because of omissions he had intentionally made—even if there was no proven intent to falsify.](#)

In that regard, the decision states: “When a repair shop does maintenance work...it must be [scrupulously accurate](#) in its records. This [repair station], by admittedly picking and choosing what to include in its records and leaving it up to the FAA and end user to guess as to whether the records contained the **full and complete** record of maintenance done on the aircraft, exhibited a willful disregard for the FARs, which were established to promote aviation safety.”

What is most concerning is this statement from the decision: “No evidence suggests that the [repair station] was required to omit information. Whether the [repair station’s] motivation was simply a desire to save time or part of a larger scheme to intentionally misinform is irrelevant. Knowledge, not motivation, is the question before this Board.”

I’ll give you a moment to reread those last two paragraphs. Yes, the Board is saying that [mechanics can lose their licenses if they fail to enter work they did, even if there was no intent to falsify](#). Say, for example, you’re troubleshooting a flight control that is stiff or binding. You check the flight controls but can’t feel anything so you start disconnecting them one at a time. On the left side, you disconnect them and put them back together, finding no problem.

You turn to the right side and you find a bad bearing. In the sign-off, you write that you replaced the bearing on the right control rod. You do not mention disassembling the left side in your troubleshooting. I don't know a mechanic who hasn't signed off a maintenance action like this. I know I have. I certainly had no intent to falsify by my omission.

And, yes, accurate maintenance records are critical. And the best policy would be to write up all the maintenance actions. But should this be grounds for a charge of falsification of records—a charge that would result in an emergency revocation—without giving you, the mechanic, [a chance to prove that the omissions were not done with the intent to falsify?](#)

This is a very disturbing decision and one that could have tremendous ramifications for mechanics and maintenance personnel throughout the industry, at repair stations, airlines, and any maintenance facility. I agree with the dissenting opinion of the NTSB chairman, Robert Sumwalt, who wrote: “The majority would apparently find that any failure to be 'scrupulously accurate' in a mechanic's logbook would foreclose the ability of a [mechanic] to subsequently argue that he or she did not knowingly make a false entry.” He further wrote, [“I do not share the majority's enthusiasm for such expansion of this jurisprudence.”](#)

Until this case is overturned, mechanics remain vulnerable to having their certificates yanked without a fair opportunity to defend themselves.

## **FAA Says Avoid Drone Registration Schemes**

The Federal Aviation Administration (FAA) wants to [warn drone owners](#) – especially hobbyists -- about people offering to “help” register their drones with the agency. The FAA Drone Zone is all you need – and it costs only \$5.00.

There are a number of entities that offer to help drone owners and operators file an application for a registration number. Some attempt to [mimic the look of the FAA's website with similar graphic design and even the FAA logo](#), or suggest they are >



skills, proficiency and knowledge through the use of carefully designed flight scenarios.

## Focused Flight Review Be a better pilot.

The association acknowledges that flying with an instructor every two years is sometimes the only opportunity some pilots take for any recurrent training although FAR Part 61.56 **does not limit** the amount of additional training a pilot might request from their local CFI. The trick for any instructor however, is organizing a session that's both **comprehensive and interesting**, work that many CFIs simply don't have the time to plan.

The ASI worked with industry partners to create the Focused Flight Review as a series of **ready-to-use scenarios** complete with preflight study material and flight profiles that focus on a variety of familiar operational areas such as stick-and-rudder skills, decision making, understanding of aircraft operating envelopes, technologies, aircraft performance capabilities and loss-of-control avoidance.

The flight profiles and preflight study resources **are downloadable as pdf files** and include Positive Aircraft Control; Weather and CFIT (controlled flight into terrain); Fuel, Engine, and Other Systems; Instrument Proficiency; Takeoffs, Landings, and Go-Arounds; and Mountain and Backcountry Flying.

<https://www.aopa.org/training-and-safety/air-safety-institute/flight-review>

<https://www.aopa.org/training-and-safety/air-safety-institute/flight-review/positive-aircraft-control>

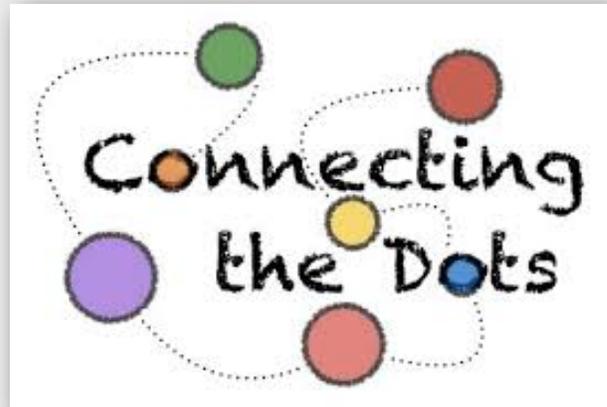
## Connecting Dots Of Safety

Evaluating everything in the aviation industry must link to safety. In aviation policy, "safety" is the most sacrosanct term there is. Around the world, it is the prime>

directive for regulators, operators and maintainers, not to mention a prime concern for passengers.

Each of the “quadrilateral group” aviation authorities—the FAA, European Aviation Safety Agency, Transport Canada and ANAC Brazil—places “safety” first and foremost in its stated missions. Many aviation businesses have the word front and center in their propaganda and strategic statements. The administrator of

the U.S. FAA’s duties, as defined in 14 USC §106, include carrying out the authority required to oversee aviation safety. It’s pretty clear, then, that the target of everything done by industry or agency should be somehow [connectible to improving or maintaining safety](#).



Take a simple example: By design, airworthiness directives (ADs) provide a fairly straight line between policy and safety. The U.S. rules for ADs (14 CFR Part 39), which the agency wrote as part of the government’s Plain Language Program, state that an AD is issued when an unsafe condition exists that is likely to exist or develop elsewhere. The resulting rule must include inspections, conditions, limitations and actions related to resolving the condition. (Of course, the lines might get squiggly sometimes in practice, but the purpose as defined in the rules is clear.)

Other policy issues can require more careful thought to connect to safety. For instance, an industry-wide coalition of aviation interests is working in Washington to create a program to [stimulate the development of aviation maintenance talent](#). Finding and retaining skilled workers may not seem like it has a direct impact on safety, but it certainly remedies an “[unsafe condition](#)” in the form of pressure on an overburdened workforce. It also helps industry mitigate the risk of lost experience by building a pipeline of talent and diversifying its human resources.

In other situations, “safety” can be the last stand against a new development. In its ongoing effort to improve guidance related to remote connectivity, ARSA has had to ease the concerns of many doubters asserting that using such technology for oversight or instruction will have an adverse effect on safety.

How could that be, if the equipment in use provides “adequate coverage, fidelity and integrity” of experience to accomplish the task the same as it would in-person-on-premises?

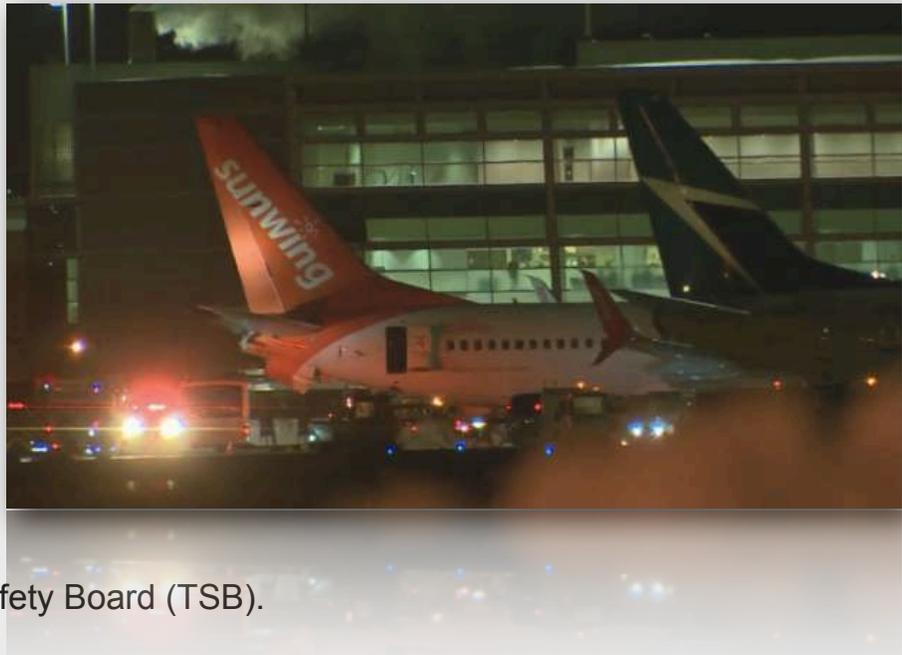
Questioning safety effects is a reasonable and necessary step in aviation policymaking. It must, however, lead to a critical assessment of the factors at play and the potential effects of the issue being considered. [The dots have to connect.](#)

If someone defends a policy priority based on an inferred or imagined impact on safety, they are on shaky ground. No matter what our goal—simplifying procedure, clarifying instruction, making various mandates consistent, re-thinking enforcement—the work of pursuing it has to consider its impact on the continued safe flight of an aircraft and safe operation of an airspace.

## **Ground crew to blame for fiery plane collision at Pearson in January, TSB says**

2 jets collided on the ground, leaving 1 plane on fire, passengers running for the exits

A fiery collision earlier this year between two planes was the [fault of the ground crew](#) at Toronto's Pearson International Airport, according to a new report from the Transportation Safety Board (TSB).



Nobody suffered major injuries, but hundreds of passengers were put at risk when two Boeing 737-800 aircraft — one operated by Sunwing, the other by WestJet — touched wings on the ground on Jan. 5, sparking a fire that passengers captured on video.

The report, released Wednesday, says a ground crew handling the Sunwing aircraft towed the jet backward **without what are known as "wing walkers"** — members of the crew who make sure the plane's wingtips don't collide with a ground vehicle or another aircraft.

The TSB says that violates the rules of Swissport, the aviation services company that coordinates ground crews, Sunwing and the Greater Toronto Airports Authority (GTAA).

Additionally, the evacuation process was made more difficult because passengers **had refused the instructions** of flight attendants.

According to the report, flight attendants had repeatedly asked passengers to leave carry-on baggage behind, which several passengers **didn't do**.

Other irregularities included the fact the plane's **emergency lights had failed to activate during the evacuation**, as well as the use of **"phraseology"** the GTAA calls inconsistent with their procedures.

The GTAA also said that due to **large distances and obstructions**, airport officials often do not have a clear view of certain areas, including the parking area named in this incident.

<https://www.cbc.ca/news/canada/toronto/ground-crew-to-blame-for-fiery-plane-collision-at-pearson-in-january-tsb-says-1.4742396>

## Rash of Fatal Crashes Prompts Broad Warning By Helicopter Safety Advocates

The recent helicopter crash in Williamsburg, Virginia, marked the latest incident in what the U.S. Helicopter Safety Team (USHST) is calling "[the worst 10-day stretch of fatal accidents \[in the U.S.\] since late 2012.](#)" It's now calling on the helicopter community to remember important safeguards before flying.

In an open letter to the U.S. helicopter community distributed Thursday, the team refers to the four fatal accidents that occurred from [June 29 to July 8](#) in Texas, Puerto Rico, Indiana and Virginia. Each caused one fatality. "Within the 50 states plus D.C. and Puerto Rico, four fatal helicopter accidents and four fatalities occurred from [June 29 to July 8, 2018](#), a pace of [nearly one fatal accident every other day](#)," the letter reads. "Investigations take time, so the underlying cause of each case will not be known for some time. However, there is one thing we know with certainty. None of the individuals involved in these tragic events [woke up that morning thinking this would be their last helicopter flight](#)."

The series of fatal helicopter accidents is a reminder to our community. There is sometimes a fine line between a flight that ends uneventfully and one that ends disastrously."

The team noted a similar trend in 2012 in which five fatal helicopter accidents occurred in California, Texas, Florida, Michigan and Illinois from Nov. 25 to Dec. 10.

[The letter lists five reminders for flying helicopters:](#) review basic procedures, think through what actions you would take for various emergencies, consider how summer temperatures affect performance and aircraft limitations, consider factors that may build up cumulative fatigue and practice real-time risk management.



"As a community, let's all do our part to ensure the 10-day surge in fatal helicopter accidents is an anomaly and does not stretch into a long-term trend," the letter concluded.

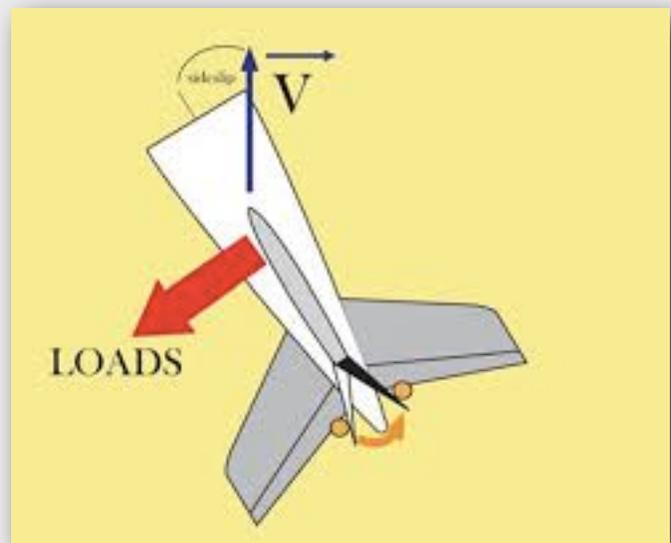
In the most recent accident last weekend, a Robinson Helicopter R44 crashed into an apartment building in Williamsburg, Virginia. The pilot and one apartment resident were killed.

## FAA Proposal To Address Rudder Reversal Load Concerns

The FAA is proposing to require newly certified large transport-category airplanes be designed **to withstand the loads caused by** rapid reversals of the rudder pedals. The requirement would apply to Part 25 airplanes that have a **powered rudder control surface or surfaces**, which would include all but the smaller business jets.

The agency says this rule is necessary "because accident and incident data show that pilots sometimes make rudder reversals during flight, **even though such reversals are unnecessary and discouraged by pilot training programs.**" Current design standards do not require the airplane structure to withstand the loads that may result from such reversals, although the FAA concedes that these incidents are "low-probability events."

If the airplane loads exceed those for which it is designed, "the airplane structure may fail, resulting in catastrophic loss of control of the airplane."



This proposal aims to prevent structural failure of the rudder and vertical stabilizer that may result from these rudder reversals. The agency estimates the cost of compliance by business jets without fly-by-wire rudder controls would be about **\$235,000 per aircraft**. The cost would be “minimal” for aircraft with FBW rudder controls.

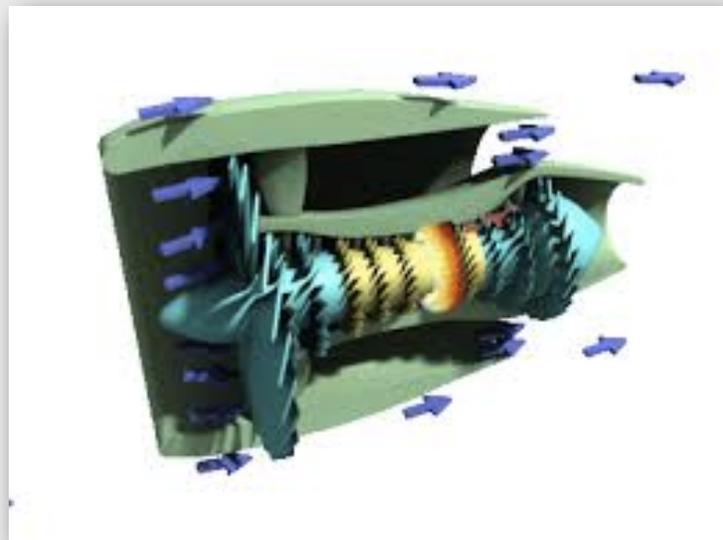
In 2016, the European Aviation Safety Agency (EASA) began applying “special conditions” to new airplane certification programs, mandating that manufacturers address the risk of rudder reversal and late last year proposed to adopt the special conditions into its Part 25 basic rules.

The FAA says the requirements by EASA match those proposed in this NPRM. Comments are due by October 15.

<https://www.gpo.gov/fdsys/pkg/FR-2018-07-16/pdf/2018-15154.pdf>

## **Engine Core Included in Bird-ingestion Testing Proposal**

Under an FAA proposal released on Friday, **the cores** of newly designed aircraft powerplants would need to continue to run after ingesting a medium or large size bird while operating at the lower fan speeds associated with takeoff climbs or landing approaches. Current FAA regulations ensure bird ingestion capability of only the engine fan blades.



The proposed test consists of firing at the engine core the equivalent to the largest bird currently required. For departure, the test bird would be fired at 250 knots, with the mechanical engine fan speed set at the lowest expected speed when climbing through 3,000 feet agl. After bird ingestion, the proposal would require that the engine complies with post-test run-on requirements similar to those in the existing rules.

If the applicant determines that no bird mass will enter the core during the test at the 250-knots/climb condition, then the applicant would be required to perform the test simulating descent configuration. For this test, the bird would be fired at 200 knots with the engine fan speed set at the lowest fan speed expected when descending through 3,000 feet agl on approach to landing.

Applicants would be required to comply with post-test run-on requirements that are the same as the final six minutes of the existing post-test run-on requirements for large flocking birds. This is based on the assumption that the airplane will already be lined up with the runway.

Comments on the notice of proposed rulemaking are due by September 4. Meanwhile, the European Aviation Safety Agency notified the FAA that it intends to incorporate requirements similar to those proposed into its engine bird ingestion rule.

<https://www.gpo.gov/fdsys/pkg/FR-2018-07-06/pdf/2018-14270.pdf>

## **Research Explores the Human Side of Autonomous Driving**

A special article collection on the [human side](#) of autonomous driving features Embry-Riddle research that looks at how positive and negative media portrayals of driverless affect consumer perceptions of the technology.

The article collection, published by Elsevier and freely available until Dec. 31, 2018, covers six levels of automation, from none to hands-off driving. The editors note, however, that “regardless of the level of automation we reach, there **will always be a human side to autonomous driving**, whether it’s the psychology behind getting people into self-driving cars or the policy implications of the technology.”



In a pair of Embry-Riddle studies, people were more willing to ride in driverless vehicles after hearing positive information about them, and less willing to ride after hearing negative information. Because people from India are significantly more willing to ride in driverless vehicles compared to Americans, the researchers also looked at the effect of nationality on an individual’s willingness to forego a human driver. Females from India had the highest willingness-to-ride scores, researchers found.

<https://www.sciencedirect.com/science/article/pii/S0967070X17305450?via=ihub>

[https://www.elsevier.com/social-sciences/transportation/transport-collection?utm\\_campaign=STMJ\\_76867\\_SC&utm\\_medium=email&utm\\_dgroup=SC&utm\\_acid=40131560&SIS\\_ID=-1&dgcid=STMJ\\_76867\\_SC&CMX\\_ID=&utm\\_in=DM312415&utm\\_source=AC\\_30](https://www.elsevier.com/social-sciences/transportation/transport-collection?utm_campaign=STMJ_76867_SC&utm_medium=email&utm_dgroup=SC&utm_acid=40131560&SIS_ID=-1&dgcid=STMJ_76867_SC&CMX_ID=&utm_in=DM312415&utm_source=AC_30)

<https://www.sciencedirect.com/science/article/pii/S0967070X17305450?via=ihub>

## Give ‘Em a Break: Employees Want Their Lunch Break Back

Even though employees value lunch breaks, [many don't take them](#). What can employers do to address this and make sure their workforce [is energized](#) in the afternoon? A new survey shows the vast majority of employees take into account whether they get a lunch break when scouting for a job. Once they land that gig, however, results also show that more employees are [scarfing down a sandwich](#) rather than leisurely dining on dim sum.



“[Take Back the Lunch Break](#)” shows that 27 percent of the 1,600 North American survey participants don't take a lunch break each workday. The study notes that going out for lunch helps workers [feel more engaged and productive](#), said Jennifer J. Deal, senior research scientist at the Center for Creative Leadership and affiliated research scientist at the Center for Effective Organizations at the University of Southern California.

“If you think about athletes, there's halftime for a reason, right? Because halfway through any endeavor, [you need a break](#). You need to take time to breathe and not continually engage in the activity,” said Deal, who partnered with workplace hygiene company Tork for the study. “For people in the workplace, taking a lunch break is just that. [It's halftime.](#)”

Employees who took a lunch break every day scored higher than those who didn't in the survey results for [job satisfaction](#), the likelihood to continue working at the same company, and recommending their employer to others.

Deal said employees want to be perceived as hard-working so they bypass lunch and power through the day.

There may be some truth to that, given that survey results show **22 percent of supervisors think employees who take regular lunch breaks are less hardworking.**

Employees and employers can nibble away at the problem. Deal recommends that employees pay attention to their **energy levels** to notice when they start to get drained. **And employers can help change the culture at the company.**

“**You need to model the behavior** and not reward the person who never takes breaks. So, it’s a matter of modeling behavior, encouraging behavior and rewarding behavior,” Deal said.

## **How to Avoid Driving Drowsy**

**37% of people admitted to falling asleep behind the wheel.** Here’s what to do to make sure you’re not one of them, according to *NBC News*.

Perhaps you were coming home from a tiring day at the beach with your family, commuting to work, or pushing through the last leg of a long road trip. Your eyes felt heavy and began to droop. **And you fought off an endless series of yawns** while struggling a bit to keep your eyes on the road. **Sound familiar?**

**DROWSY IS DEADLY**

DROWSY DRIVING KILLS BETWEEN **5000 & 8000** PEOPLE EVERY YEAR NEARLY TWICE AS MANY AS **DISTRACTED DRIVING & 5 TIMES AS MANY AS THE TITANIC**

**REST AREA** **IF YOU FEEL DROWSY** FULLY OVER AND TAKE A NAP

**1.2 MILLION COLLISIONS** ARE CAUSED BY DROWSY DRIVING EACH YEAR

**7 IS GOOD** **8 IS GREAT!** DRIVERS NEED AT LEAST 7 HOURS OF SLEEP TO DRIVE SAFE AND SOUND

**1 of 3 DRIVERS** are driving drowsy

**83.6 MILLION** PEOPLE DRIVE WHILE SLEEP-DEPRIVED EVERY DAY

DROWSY DRIVING INCIDENTS COST THE COUNTRY **\$109** BILLION IN 2015

The infographic features several icons: a car crashing into a car, a ship sinking, and three stylized human figures. The text is presented in various colors and sizes to emphasize key statistics.

Reports show that for many of us it does. This year, AAA reported that the number of crashes [involving drowsiness is almost eight times higher than federal estimates indicate](#). And according to the National Sleep Foundation's Sleep in America poll, 60 percent of adults admitted to driving drowsy and 37 percent admitted to having fallen asleep at the wheel.

[Get the full story at www.nbcnews.com](http://www.nbcnews.com)

## **WANT A LEGO JET ENGINE? VOTE NOW!**

And finally, for your daily bit of fun, Rolls-Royce wants to produce a [LEGO brick version](#) of its next-generation UltraFan engine.

Simon Burr, director of engineering and technology, hopes that the kit will encourage new engineers. "We hope our LEGO UltraFan captures the imagination of the engineers of today and tomorrow. I'm sure anyone who manages to make all the parts come together will get some sense of the satisfaction we feel when one of our engines runs for the first time."

The LEGO engine needs just 1,000 further votes to reach the 10,000-vote threshold that means the manufacturer will consider it for production and sale.



[More details](#) about the engine can be found on the [LEGO website](#).

## **Students Sing Praises Of Music Teacher**

For 30 years high school music teacher Robert Moore directed one of the greatest high school choral groups in the country, the Ponca City Chorale, of Ponca City Okla. Now retired, Moore would love [nothing more than a repeat performance](#). Unknown to Moore, that is precisely what his former students arranged to surprise their mentor.



<https://www.cbsnews.com/video/students-sing-praises-of-music-teacher/>