

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:

★NASA Talk Examines How Math Located Air France 447 Wreckage

★Pilots blamed for TransAsia Airways crash on Taiwan island

★QF32 pilot recognized for aviation safety

★Airlines aren't learning enough from near misses

★Lack of Teamwork

★Turbulence appears on the rise, and airlines need better detection: researcher

★NTSB Cites Engine Modifications in 2013 Air Ambulance Crash

★First flight after oil change goes awry

★And Much More

NASA Talk Examines How Math Located Air France 447 Wreckage

On June 1, 2009, Air France Flight 447 with 228 passengers and crew disappeared over the Atlantic while on a flight from Rio de Janeiro to Paris. About two years after the loss of the aircraft and four intensive searches, a group of statisticians was able to predict almost the exact location of the wreckage. [Searchers found it within a week.](#) On Tuesday, Feb. 2, at NASA's Langley Research Center in Hampton, Virginia, J. Van Gurley will present "Bayesian Search for Air France 447: [The Math that Found a Needle in a Haystack](#)" at 2 p.m. in the Pearl Young Theater. Gurley is with Metron, Incorporated, whose Advanced Mathematics Applications Division is credited with producing the analysis that found the aircraft.



Bayesian statistics is a set of mathematical rules for using new data to continuously update an existing knowledge base. A well-developed method for planning searches for missing aircraft, ships lost at sea, or people missing on land, Bayesian search theory combines all the available information about the location of a search object. This is important in one-of-a-kind searches where there is little or no statistical data to rely upon.

The theory has been applied successfully to searches for the missing nuclear submarine USS Scorpion and the 1857 shipwreck of the SS Central America. It is used routinely the by U.S. Coast Guard to find people and ships missing at sea.

Gurley's talk presents the basic elements of the theory and how it was used to locate the wreck of Air France flight 447 [after two years of unsuccessful search.](#) He will finish with a discussion of the current search for Malaysian Air flight 370 in the Indian Ocean, describing what is known and how the Bayesian approach could be used to guide search efforts.

As a senior manager at Metron in the District of Columbia, Gurley leads a number of research and development efforts in predictive analytics, data fusion, and mission planning for the Defense Advanced Research Projects Agency, Office of Naval Research, and Federal Aviation Administration.

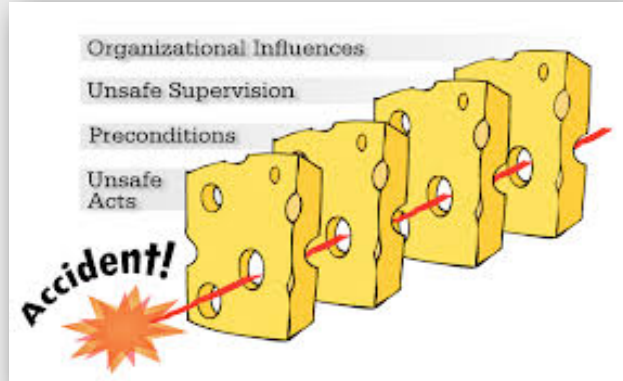
Prior to joining Metron, he completed a 26-year career in the United States Navy rising to the rank of captain while serving as a submarine warfare officer, and naval meteorology and oceanography specialist. His education includes a Bachelor of Science in physics from the University of Florida, and a Master of Science and engineering degrees in ocean engineering awarded jointly by the Massachusetts Institute of Technology and Woods Hole Oceanographic Institute.

For more information about NASA Langley's Colloquium and Sigma Series Lectures, visit:

<http://colloqsigma.larc.nasa.gov>

Pilots blamed for TransAsia Airways crash on Taiwan island

Taiwan's aviation authorities have concluded that a plane crash that killed 48 people on a domestic flight was due to pilot error **and a failure within the airline to follow safety procedures**. The TransAsia Airways plane crashed on July 23, 2014, in stormy weather trailing a typhoon, killing 44 passengers and four crew members. Ten passengers survived.



Taiwan's Aviation Safety Council said in a report Friday that the crew on Flight GE222 did not realize they were too close to the ground while landing on the island of Penghu and **repeatedly failed** to follow standard operating procedures during the flight.

It said the captain flew the aircraft too low without first making visual contact with the runway, likely because he was **overconfident of his flying skills**, and the first officer **did not correct his mistake**.

Other contributing factors included bad weather that reduced visibility and **poor communication** of weather information to the flight crew, the council said.

The twin propeller ATR-72 crashed in a residential area about a kilometer (half a mile) from the runway and caught fire. Five people on the ground were injured.

Seven months later, TransAsia Airways had another fatal crash, this time in Taipei shortly after takeoff, killing 43. A preliminary investigation indicated that the pilot [mistakenly shut off the remaining working engine](#) after the other one went idle.

Friday's report criticized a ["prevalent tolerance for non-compliance with procedures"](#) within the airline's ATR fleet."

TransAsia said in a statement that it respected the investigation results, and that it would promote a [flight safety culture](#), including by setting up a safety committee and promoting people with good safety records.

The TransAsia crash was Taiwan's first deadly civil aviation accident since 2002, when a China Airlines plane went down shortly after takeoff, killing 225.

QF32 pilot recognized for aviation safety

When pilot Richard de Crespigny guided a jumbo with a blown engine carrying 469 passengers safely to ground, awards and recognition were the last thing on his mind.

Mr De Crespigny was at the helm of Singapore to Sydney flight QF32 in November 2010 that had the potential to be one of the world's worst air disasters when an explosion shattered one of its engines.

More than five years on from the ordeal, the pilot has been appointed a Member of the Order of Australia for significant service to the aviation industry, particularly to flight safety.

[He credits his entire team](#) for the safe outcome that day, likening his role as team leader to a conductor in an orchestra.



"I can't make the music, but I can guide people to make it," Mr de Crespigny told AAP.

"People play together and you make great symphonies.

"The courageous work was done in the team, and I'll be forever grateful to all those people who returned 469 passengers to their families and loved ones."

Since the event, Mr de Crespigny believes he has been given a "pulpit" to share his experiences.

Alongside roles with various international aviation bodies, he travels the world to advise companies on resilience during crises.

"You're combining your knowledge, your training, your experience, working in teams to survive unexpected events," he said.

"You need good decision-making, good leadership.

"But if you have all these elements together, you can survive the unthinkable."

He is also a patron for Disabled Winter Sport Australia, a charity which assists people with disabilities to participate in winter sports.

He encourages participants to focus on ability rather than disability.

"We show these people they can achieve great things," Mr de Crespigny said.

"We give them confidence, which builds their courage."

Airlines aren't learning enough from near misses

Near misses with less obvious signs of risk getting ignored

Brigham Young University

IMAGE: When it comes to flight safety, US airlines are pretty good at learning from accidents.



But new research shows airlines should be learning more from accidents that never happen.

When it comes to flight safety, U.S. airlines are pretty good at learning from accidents. But new research shows airlines [should be learning more from accidents that never happen](#).

A new study led by BYU organizational behavior professor Peter Madsen finds that airlines are [flying past an opportunity](#) to increase safety by ignoring too many "near misses."

"Studies show pilots or crew members make at least [one potentially hazardous error on 68 percent of commercial airline flights](#), but very few of these errors lead to an accident," Madsen said. "Airlines need to institute policies that encourage learning from these seemingly innocuous near misses."

To be clear, Madsen is not talking about the near misses you see on the news. He and researchers from Georgetown University's McDonough School of Business poured over the safety data of 64 U.S. commercial airlines from 1990 to 2007 to determine where less obvious near-miss incidents were being ignored.

As expected, their study (published in *Risk Analysis*) found airlines improve their safety performance in response to their own accidents and accidents experienced by other airlines. [However, airlines only learn from near misses when there are obvious signs of risk](#).

Specifically, airlines pay attention to near misses that have led to accidents in the past (fire on the plane, ice build-up on wings), but don't look closely at near misses that have yet to cause an accident (airplane rolling on the runway when it should be stopped).

"We're not saying airlines aren't doing a good job--[they are paying attention to near misses more than any other industry in the world](#)," Madsen said. "That said, near misses that are considered benign might be slipping through the cracks."

Examples of "benign" near misses identified by researchers:

- Incapacitation of a flight crew member
- Software or mechanical problems with cockpit displays
- Poor handling of aircraft while decelerating on the runway after touch down
- Traffic congestion on the taxiway during aircraft taxiing
- Nuisance warnings and false alarms.

The researchers suggest airlines can improve in two ways:

- Continue successful data-collection efforts, but expand which near misses are reported.
- Remain vigilant toward deviations from normal and uncover root causes of the deviations.

Madsen said one way airline personnel can improve on the second point is by focusing on events the industry once considered unacceptable but now occur so often that they've come to be accepted as normal.

"It can be hard to learn from near misses because we're wired to ignore them," Madsen said. "But the difference between a near miss and a larger failure may only be good fortune."

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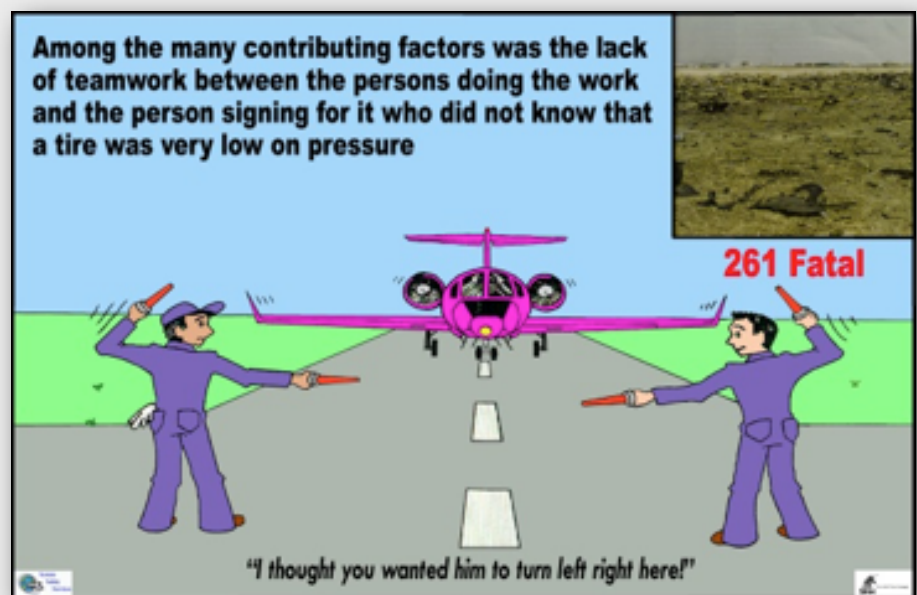
Funding for the study came in part from the U.S. Department of Homeland Security's National Center for Risk and Economic Analysis of Terrorism Events.

Lack of Teamwork

Submitted by Gordon Dupont

With permission from *D.O.M. Director of Maintenance* magazine

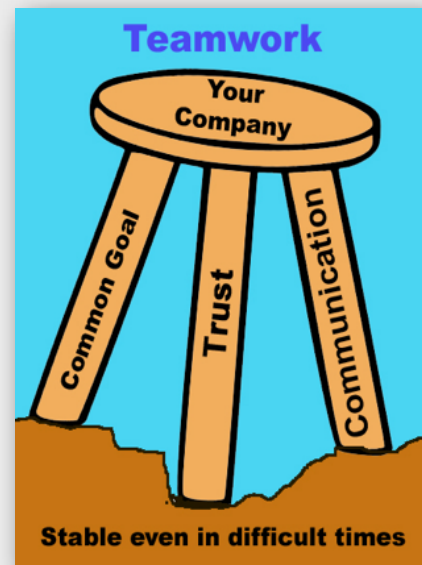
Lack of Teamwork is one of the big four, as when it exists in an organization, some of the other eleven *Dirty Dozen* are very likely to be there as well. The presence of Lack of Teamwork makes it easier for the others to occur. Lack of Teamwork played a big role in the fatal DC8 crash shown in the picture to the right.



The maintenance team of three were not communicating with the flight crew, especially the flight engineer, who had the signing authority for the maintenance being carried out. Had they been operating as a team, they, very likely, would have obtained the needed air for the low tire, as the Captain carried money for just such emergencies. [Pressure and Lack of Assertiveness](#) also played a role in the Lack of Teamwork while on this fatal charter. What is Lack of Teamwork? It is a failure to seek or consider the input of others. Simply put, [it is not working together for the best possible outcome.](#)

Teamwork is not easy, as witnessed by the high number of divorces between a team of two. The team has to be looked at as the entire organization and not just your department or crew. Teamwork is like a three legged stool. A three legged stool is stable even if the ground is uneven, unlike a four legged stool that would rock. When times become difficult, teamwork will sometimes determine if the company will survive. I've seen where employees would take a cut in pay or work less hours in order for all employees to be able to keep working and for the company to survive. Thus, one of the legs is a common goal. That calls for "everyone to sing from the same song sheet." [The bigger a company gets, the more difficult this becomes.](#) Companies have ceased to exist because the employees failed to recognize the common goal. The term is: "killing the goose that lays the golden eggs." Without teamwork, the employees see their management as the enemy and have forced their company into bankruptcy rather than give in to their "demands." There will be a lack of trust there also, which is the next leg, but the result is a lose-lose situation for all.

An organization's mission statement is often an indication of the common goal or at least it should be. [A company's mission statement should indicate what it does and how it intends to do it.](#) In it, ideally, the employees should see their job and the common goal of everyone. As we are a high consequence industry, the word Safety should be in there as well. After all, we would hope that Safety is a common goal of any organization.



The following is a mission statement of an MRO.

**“To provide our customers with airworthy aircraft in a timely manner
at the most economical price”**

This company was having a very high rate of customer returns to resolve poor workmanship. One of the first things we do when we do a Safety review is look at the mission statement. This one says “airworthy aircraft” which is a positive attribute to strive for, but “in a timely manner” indicates that getting that aircraft out on time is also a high priority goal. Actually, it was because there were penalties if the aircraft was delivered late. This was being interpreted by supervisors and employees as: **do what you have to do to meet the deadline.** Thus, shortcuts were commonly taken in order to get it out the door on time. This was resulting in a high number of worksheets being rushed and that time consuming second look being overlooked. Then we have “most economical price.” To do that; any part that was “iffy” (right on tolerance limit) was to be left in service. Most economical price, perhaps in the short run, but Safety? But everyone had a common goal as outlined by their mission statement.

Have a look at your mission statement.

☐

1. Does your company have a mission statement? It should.

☐

2. Do you know what it says? You should.

☐

3. Is this statement easily seen everywhere by all? It should be.

☐

4. Does it include the word Safety? It should.

☐

5. Does it provide a common goal everyone can work for? It should

☐

6. Can you see your job in the statement? You should.

If you were able to put a click in the box for all the questions, you likely have a good useable common goal.

Teamwork leg #2 requires trust.

Trust is hard to gain and real easy to lose. Teamwork requires trust between all segments of the company to be successful.

I have worked in companies where the level of trust was so low that some employees would go out of their way to sabotage a new idea put out by management even though the idea had benefits to the employee. It is a lose-lose of the worst kind and a danger to Safety.

A trusting culture is one of the six critical steps to a Safety culture and a must if teamwork is to help bring the many threats to Safety to ALARP. It will have a synergistic atmosphere where it is recognized that the whole is greater than the parts and a compromised solution is the result of everyone's efforts. This is a win-win and enhances the chances of Safety initiatives being followed by all.

Teamwork leg #3 is communication.

We have talked about communication in previous articles and acknowledged that it is one of the Big Four contributing factors to human error. But communication is a vital part of teamwork and without it there can not be successful teamwork.

As we have said, teamwork can be difficult even when there are only two in a team. No marriage can survive without teamwork and that calls for the three necessities for teamwork, the common goal, that all important trust and open and honest communication on all matters. The first sign of a marriage heading for divorce is usually a breakdown in communication. Companies are not that much different, but as they grow this must have leg becomes more and more difficult to maintain. Signs of the breakdown may begin to occur when changes in the company are learned in the business section of the local newspaper or worse yet, the evening news.

Companies must work hard to maintain that communication if they expect teamwork and with it a high level of Safety to be a common goal. Safety meetings are a part of this communication. With great communication comes high morale and a bonus of improved productivity. This is the result of synergy at its best.

I remained with a smaller company that paid less than the airline across the runway because the boss knew my kids' names. He'd give everyone a turkey for Christmas and threw a great Christmas party. All the components of teamwork were there. Sadly, both of my kids had crooked teeth and only the airline had a dental plan that paid a large portion of orthodontist costs for braces. So I crossed the runway to work in a company with little teamwork. One example of that was when a generator required replacing. Only an avionics person could remove and replace the three heavy wires connecting the generator to the aircraft. I could replace the generator, but not disconnect or reconnect the wires unless I was at an outer base and the only qualified person there. On midnight shift, it could take an hour to get an avionics person up to the ramp from the hangar, especially if it was a rainy night. I would call for the avionics person, change the generator and when he arrived, he could reconnect it. When asked who disconnected the wires I would reply the phantom avionics I guess. Most would sign both, but now and again one would be called to the shop steward's office to explain. Teamwork was very low and did nothing to advance Safety.

[As a company grows, a company newsletter becomes a must.](#) With this should be a hazard reporting form and even a suggestion box to enable a level of communication to be maintained.

Teamwork is a must if we are to bring the many hazards to Safety to ALARP ([As Low As Reasonably Possible](#)). We all have to do our part.

Turbulence appears on the rise, and airlines need better detection: researcher

Extreme turbulence of the kind that injured seven people on a flight diverted to Newfoundland last month appears on the rise, and airlines need improved technologies to detect it, according to a British researcher.

"We need to take it (air turbulence) seriously," said Paul Williams, an atmospheric scientist who has published papers arguing [climate change is likely to increase the amount of high-altitude turbulence](#). "I think there is a compelling case that there's an increase in turbulence and for investment in improving the detection and prediction of clear air turbulence," he said in a telephone interview on Tuesday from his office at the University of Reading.

Last month incident, American Airlines flight 206 was diverted to St. John's, N.L. Passengers described a lasting bout of turbulence over the Atlantic that suddenly developed into dips so jarring that people were praying for their lives.

The incident comes just weeks after air turbulence struck an Air Canada Boeing 777 flying from China to Toronto, resulting in 21 injuries to passengers and the launch of a Transportation Safety Board probe.



Last year, 31 people were injured in air turbulence events, up sharply from the single incident in 2014 and the 15 cases in 2013, according to Transport Canada.

Williams co-published a 2013 paper in [Nature Climate Change](#) that used a climate change model to compare a pre-industrial climate with one that contained double the amount of carbon dioxide, and make predictions on long-term increases in air turbulence events over the North Atlantic.

The scientist says carbon dioxide is causing a long-term trend towards temperature changes high in the atmosphere, including at the cruising heights of airliners, and that is changing wind patterns.

"In scientific terms, [there is a wind shear](#). Different layers of the atmosphere are meeting at different speeds and there is a kind of friction and that causes clear air turbulence to break out," said Williams.

The paper predicts the average strength of trans-Atlantic turbulence at cruising altitudes could increase by between [10 per cent and 40 per cent](#), and the amount of airspace likely to contain significant turbulence by between [40 per cent and 170 per cent](#).

"Our results suggest that climate change will lead to bumpier trans-Atlantic flights by the middle of this century," the paper said.

Williams says many airplanes have technology that can detect turbulence in clouds, but are less capable of detecting turbulence in clear, higher skies.

"We need to come up with better methods for predicting when and where clear air turbulence will strike ... We can by running computer models come up with areas where there will be turbulence, but they can be improved," he said.

A spokesman for American Airlines confirmed Sunday's injuries came after the airplane hit clear air turbulence.

Ross Feinstein, a spokesman for the airline, said the seatbelt sign was lit up and the airline is reviewing why the injuries occurred.

"There are a lot of aircraft that cross the Atlantic and Pacific each and every day and it's very uncommon this occurs. ... I can't stress enough that if you're in the seat, fasten your seatbelt especially when the seatbelt sign is on," he said.

Spokespeople for Air Canada and WestJet also both emphasized the importance of [wearing seatbelts at all times](#).

Robert Palmer, the spokesman for WestJet, says "like any meteorological event, the ability to forecast turbulence accurately 100 per cent of the time is not an exact science."

However, Williams said new technologies are emerging that can give people extra time to get their seatbelts on.

He says a consortium in Europe is using a [laser that beams from the front of the plane](#) and detects patterns of turbulence, allowing time to change course.

Larry Vance, a consultant with Accident Investigation and Research Inc. in Ottawa, said that for the time being seatbelts are the key to injury prevention.

"With technology the way it is now, there's no way that pilots are equipped to avoid clear air turbulence. It can't be seen so you fly into it, and you just have to be ready for it," he said.

NTSB Cites Engine Modifications in 2013 Air Ambulance Crash

Accident investigators said that engine modifications made to an air ambulance helicopter may have [left it more susceptible to icing](#) and contributed to its fatal crash in 2013.

The Airbus Helicopters AS350 B2, operated by EagleMed, had taken off early on Feb. 22, 2013, from Integris Baptist Hospital in Oklahoma City to commence an inter-hospital patient transport flight. It

appeared to suffer loss of engine power during its initial climb, crashed into a nearby parking lot and erupted in a post-crash fire. Both the pilot and flight nurse were killed, while the paramedic sustained severe injuries.



The NTSB, in its Jan. 14 Probable Cause Report, blamed loss of engine power due to [engine ice ingestion](#) for the crash, citing as contributing factors, “[the lack of an installed engine air inlet cover while the helicopter was parked outside](#), exposed to precipitation and freezing temperatures before the accident, and the pilot’s [inadequate preflight inspection](#) that failed to detect ice accumulation in the area of the air inlet.”

Details concerning an engine modification stand out in the report. Instead of the Turbomeca Arriel 1D1 turboshaft engine that comes standard on the AS350 B2, the helicopter had been given a Honeywell LTS101-700D-2 turboshaft engine under an STC from Soloy Aviation Solutions—a process that involved modification of the engine air intake system. The NTSB said that [as a result of this modification](#), the air inlet screen was “angled slightly upward,” leaving an unprotected opening at the aft end of the air inlet screen as well as “a gap in the area where the air inlet screen and blanking plate overlap” in which moisture or debris could feasibly collect.

Soloy said the STC offered the option of installing an inlet air filter kit by Aerospace Filtration Systems during the engine conversion, while another STC offered its installation after engine conversion. [The accident helicopter was not equipped with the kit.](#)

On the night before the accident, the helicopter was left out overnight without an engine intake cover installed. On the morning of the accident, camera footage showed that the pilot, Mark Montgomery, performed his morning preflight check in [low lighting conditions](#), leading the NTSB to believe that he may have not seen the accumulation of ice in the intake.

But according to [Seattlepi.com](#), Timothy A. Loranger, an attorney for the pilot’s family, criticized that implication—saying that the “design issue” impeded the pilot’s ability to inspect the aircraft. The pilot’s wife, EagleMed and an insurance company have sued the helicopter and engine manufacturers, as well as the engine modification package designer. The case is currently with the Oklahoma Court of Civil Appeals.

The NTSB investigation has resulted in a number of changes from the involved parties. EagleMed has painted the blanking plate adjacent to the air intake screen matte black to aid in future preflight inspections and modified its engine air intake inspection procedure. It also has begun carrying engine air intake covers at all times. Also, Honeywell, Airbus and the FAA Rotorcraft Directorate each have released safety documents pertaining to flight operations in icing and snowing conditions.

First flight after oil change goes awry

The private pilot and his two passengers departed on a local pleasure flight in the Cessna 210 near Pagosa Springs, Colo. Right after takeoff,



[engine oil covered the windscreen](#) and the engine began to lose power.

According to a video of the accident, the pilot made a tear-drop turn in an attempt to land on the opposite runway. The airplane lost altitude during the turn and the pilot overshot the runway. He said that as he crossed over the runway, he reduced power to idle. As he attempted to turn back toward the runway, he turned off the master switch.

The plane descended quickly and landed adjacent to the runway in packed snow. The airplane landed hard on the main landing gear and with the right wing low before it slid for about 300 feet, resulting in substantial damage to the fuselage and right wing, and causing minor injuries to two of the plane's occupants.

The landing gear, right flap, left wing tip, and all three propeller blades were also damaged.

Post-accident examination of the engine revealed [the oil filler cap was not secured to the oil filler neck](#). The pilot said this was the first flight after the oil had been changed by a maintenance facility. [He did not check the oil filler cap before the flight because it was not required by the FAA approved preflight inspection checklist](#).

The NTSB determined the probable cause as the pilot's inadequate preflight inspection which led to a loss of oil pressure and partial loss of engine power on takeoff. Contributing to the accident was the pilot's failure to check the security of the oil filler cap prior to the flight.

NTSB Identification: [CEN14CA106](#)

This January 2014 accident report is provided by the [National Transportation Safety Board](#). Published as an educational tool, it is intended to help pilots learn from the misfortunes of others.

Qantas beefs up workplace safety practices

Qantas will spend \$680,000 to strengthen its workplace safety procedures after a cleaning contractor [fell and hurt his back](#) at Canberra Airport.

An employee of Qantas contractor Star Aviation fell backwards from a service door as he cleaned the cabin of a Q400 turboprop aircraft parked in the airport's QantasLink hangar on January 31, 2014. The worker dropped 1.5 meters onto the concrete ground of the maintenance hangar and sustained spinal injuries.



He has since returned to work.

WorkSafe ACT investigated the incident and alleged the airline [breached its duty of care](#) under the Work Health and Safety Act.

As a result, Qantas entered into an enforceable undertaking – a legally binding agreement often used as an alternative to court action – with WorkSafe ACT to improve its safety practices and policies.

Under the agreement the airline has agreed to six terms, outlined in a notice published on Friday, including the [purchase of new "fall from heights" infrastructure](#) for the ACT.

Part of the agreement is a \$70,000 donation to the Snowy Hydro Southcare rescue helicopter.

The company will also develop an [injury and hazard reporting app](#), standardize workplace induction processes across the group and complete a university research project related to contractor safety management.

ACT WorkSafe Commissioner Mark McCabe welcomed the company's decision to accept the agreement and its response to the accident.

"The great thing about Qantas agreeing to enter into this enforceable undertaking is that rather than go through lengthy court action, they're investing a fair bit of money into health and safety and that's a far better outcome than spending it on lawyers, which is where quite a bit of the money goes."

Mr McCabe said the changes Qantas had agreed to implement covered three key aspects of enforceable undertakings, which meant the improvements had to include benefits for the airline's workers, the aviation industry as a whole and the broader community.

"We think this is an excellent example of a good corporate citizen. Yes, a person was injured but they have improved health and safety and are doing something for the broader community."

A Qantas spokeswoman said the airline put numerous safety measures in place immediately after the man was injured to ensure a similar incident didn't happen again.

It had worked with WorkSafe ACT to develop the additional safety improvements.

"At Qantas, safety is always our first priority and we are committed to ensuring that our workplaces are safe at all times."

Mr McCabe believed enforceable undertakings had been an under-used component of recently overhauled workplace health and safety laws but workplaces were increasingly seeing the benefits.

["A number of employers are getting on the front foot and turning bad accidents into a positive thing for the community,"](#) he said.

REPORT: Airline Safety and Losses annual review 2015

Each year, Flightglobal conducts an annual review of the previous year from both an insurance and safety perspective. This report includes detailed loss and liability data, as well as accident information and analysis



[.Download the report here](#)

FAA readying annual GA survey

The FAA is asking for help on the thirty-eighth annual General Aviation and Part 135 Activity Survey, covering calendar year 2015. The annual survey serves as the only source of information on the GA fleet, the number of hours flown, and the ways people use GA aircraft. [The data will be used to determine funding for](#) infrastructure and service needs, assess the impact of regulatory changes, and measure aviation safety. It also will be used to calculate fatal accident rates for GA and Part 135 aircraft.



The aircraft owners selected to complete this year's survey will receive a postcard invitation to participate in the survey soon. It can be completed online, or a survey form will be mailed along with a postage-paid envelope. The FAA requests that those who receive a postcard fill out the survey even if an aircraft wasn't flown in 2015, or was sold or damaged.

The survey is being conducted on behalf of the FAA by Pasadena, California-based Tetra Tech, an independent research firm. The information gathered in the survey will be used for statistical purposes only. It will not be published or released in any form that identifies any participants.

For questions, please [email Tetra Tech](#) or call 800/826-1797.

Previous years' survey results can be found [here](#).



Human Factors Ground School - Online Information and Enrollment Page

Task Load vs Pilot Capability



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Lack of Assertiveness

What do you think or does anybody have a better idea?



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The Dirty Dozen

Complacency	Fatigue	Norms
Lack of Assertiveness	Lack of Teamwork	Lack of Awareness
Distractions	Lack of Communication	Stress
Pressure	Lack of Knowledge	Lack of Resources

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Flying high: Remembering Pan Am

It was an aviation pioneer, and became a symbol of America during the Golden Age of air travel. But while Pan Am no longer flies the friendly skies, many of the women who proudly wore the Pan Am uniform talked with Connor Knighton about the glory days - when flying was glamorous, complete with gourmet food on board.



<http://www.cbsnews.com/videos/flying-high-remembering-pan-am/>

Book: Skygods: The Fall of Pan Am

