

# Aviation Human Factors Industry News

*Volume XIII. Issue 23, November 12, 2017*



*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:

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## **NTSB: Log error contributed to Chatham helicopter crash**

A helicopter crash at Crows Pond in June 2016 that seriously injured two people **began with an error** in the aircraft's maintenance log that contributed to a mechanical failure, according to the National Transportation Safety Board.



On June 17, 2016, Tyra Pacheco, an Acushnet-based photographer, was shooting aerial real estate photos in Chatham with John Ryan, her go-to helicopter pilot. The pair had flown out of Plymouth Municipal Airport earlier that day and Pacheco had a long list of houses to shoot. It was bright and sunny; “a perfectly normal day,” Pacheco later said. At about 12:45 p.m., the helicopter was about 300 feet above the saltwater pond off Fox Hill Road when the engine “oversped” and eventually lost power, according to the NTSB’s final report on the crash, which was issued in September. Ryan felt a lateral shudder and the low oil pressure light and the clutch light came on, the report says.

The helicopter gave a “violent yaw” and Ryan tried to get it to shallow water near the shoreline, according to the report. The helicopter had a hard landing and came to rest on its left side in the marsh side of the pond, where a neighbor doing her bills and golfers at the Eastward Ho! Country Club saw it tumble out of the sky.

Pacheco and Ryan both suffered serious injuries. Almost the entire right side of Pacheco’s body was broken; she damaged three vertebrae, hurt her arm and severed part of her index finger.

The helicopter’s engine cooling fan shaft had separated, the NTSB found. Without that fan shaft, the engine started to overspeed, causing damage to the engine and eventually a total loss of power. An examination of **a bearing revealed that its rollers had seized and that no grease was recovered**, “consistent with a lack of lubrication,” the report says.

An employee of the helicopter manufacturer correctly noted a repair in the logbook nine years before the crash, but **incorrectly noted** the time since the last overhaul as a little over four hours rather than the nearly 560 hours that had passed, **an error that continued throughout the logbook**, according to the report.

The Robinson R44 helicopter's manufacturer maintenance manual requires that the entire airframe be overhauled every 2,200 hours, including an overhaul of the bearing, according to the report. The earlier maintenance logbook entry error meant that the helicopter had been **operating 52 hours beyond the mandatory airframe overhaul time limit**, the report says.

And although the bearing had been lubricated two years before and then again about a year before the crash, there was **no record of it being lubricated in the nearly five preceding years**, which likely "damaged or degraded the bearing and led to its failure" during the flight, the report says.

The Federal Aviation Administration did not participate in the crash investigation, a spokesman for the agency said. The NTSB can make recommendations to the FAA for further action after an incident, but the FAA spokesman said he was not aware of any recommendations tied to this case. There is no mention of recommendations in the NTSB's report.

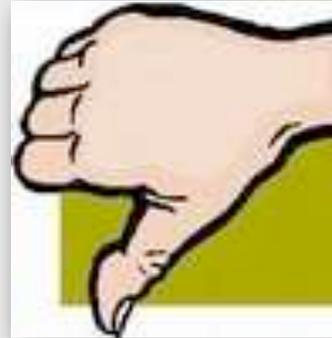
Ryan and Pacheco did not return a request for comment on Friday.

According to Ryan's company website, Ryan has been flying helicopters since 1985 and has been a flight instructor for the past 22 years.

[https://www.scribd.com/document/363460526/National-Transportation-Safety-Board-Report?&\\_ga=2.131122959.1643262290.1509918251-679562206.1509802114#from\\_embed](https://www.scribd.com/document/363460526/National-Transportation-Safety-Board-Report?&_ga=2.131122959.1643262290.1509918251-679562206.1509802114#from_embed)

## F-16 Crash Caused By Bad Maintenance

The F-16C that crashed on April 5, 2017, shortly after departure from Joint Base Andrews, was brought down by [faulty reassembly of the main engine control \(MEC\) unit during overhaul](#), according to the Air Force Accident Investigation Board assigned to the mishap. The absence of a retaining ring and associated anti-rotation pin led to malfunction of a pilot valve, which caused a massive excess of fuel to be delivered to the engine. The excess fuel first manifested as uncommanded acceleration, but rapidly progressed to engine overspeed and “a severe in-flight engine fire that extended 20 to 30 feet aft of the aircraft,” according to the Air Force. No one was killed in the accident. The pilot ejected at 2000 feet after pointing the aircraft toward a wooded area 4 miles southwest of the departure airport. [This was the first flight](#) for the single-engine fighter following installation of the overhauled MEC, which was conducted at the Air Force 552d Commodities Maintenance Squadron, Oklahoma City.



During disassembly of the MEC, Air Force forensic specialists found [two pieces missing](#), which led to the failure, along with an [extra backing ring](#) found lodged against a sealing gasket. An O-ring made of a material [other than the one specified](#) was also found in the MEC. The extra part and incorrect O-ring did not contribute to the accident, but were further evidence of a [lack of parts control in the overhaul shop](#), according to the board. Air Force Col. David Cochran, who was the president of the Accident Investigation Board, wrote, “It is critically important to ensure that all small washers, shims, pins, clips, and retaining rings are accounted for during the MEC overhaul process, in accordance with the applicable technical order guidance. Omitting or improperly installing any of these items, as stated in the technical order, did result in failure of the MEC and aircraft loss.”

## Blue Angels 'Boss' Stresses Need for Debrief in Ops

Former Blue Angels leader Greg “Boss” Wooldridge underscored the importance of a debrief to foster a culture of excellence whether in a business aviation flight department or on a Blue Angels tour. Wooldridge, the only commander to lead the Blue Angels three times, provided insight on his time with the U.S. Navy flight demonstration squadron during a keynote speech at the 2017 Bombardier Safety Standdown.



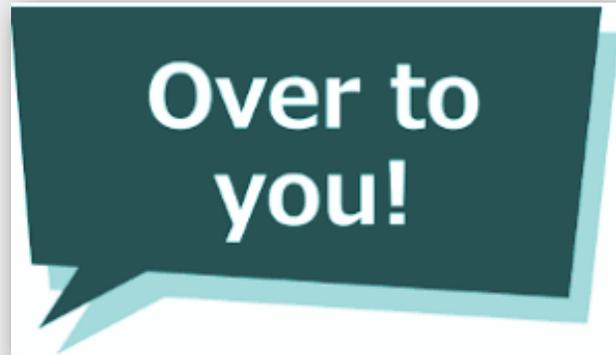
In his discussion on “Soaring To Peak Performance,” Wooldridge called a debrief—in which the Blue Angels could discuss issues that came up during a show in an open, non-punitive manner—a “game-changer” in elevating performance. The debrief often took as long as, if not longer than, the briefing session that occurred before every show. “Too often, debrief has a bad name,” he said, noting that many people wince at it because it brings up what went wrong. But with the Blue Angels, it is an opportunity for reflection, commitment to fix issues and a time for either mentoring others or being mentored. Each discussion ended with the same theme: “Glad to be here.”

Wooldridge noted he introduced a debriefing program during his time in FedEx. It was a different program than at the Blue Angels, but yielded results, he said. “We got better. The debrief is about opening yourself up.”

This was particularly important following Blue Angels missions where a squadron would fly in formation as close as 18 inches apart. This kind of operation also required absolute trust, which involved a contract to perform the mission as promised, and substantial planning, he said. He also highlighted the need for belief to reach the upper echelons of performance.

## Check yourself: Feds under fire for shifting check pilot responsibility to operators

Transport Canada is planning to stop evaluating pilots who perform checks on their counterparts at the country's largest airlines and will instead [give the responsibility to](#) the operators, a change critics say erodes oversight and public safety.



Documents show Transport Canada made the decision in May when the House of Commons transport committee was reviewing aviation safety and subsequently recommended [more on-site inspections generally](#) of the airline industry instead of paper audits.

A risk assessment document and an internal letter from Transport Canada's director of national operations for civil aviation were obtained under an access to information request by the Canadian Federal Pilots Association, the bargaining agent for about 450 pilots, most of whom work for the federal government.

Transport Canada's evaluators test so-called check pilots for the large airlines, who in turn evaluate the pilots in their own organizations.

The letter says the changes will take place April 1 for airlines with planes that fly more than 50 passengers.

The accompanying risk assessment acknowledges Canada [is moving away](#) from the mainstream practices used in other countries.

"It could be argued that Canada's experience and relative maturity with systems-based surveillance will adequately complement this shift of responsibilities ... and therefore mitigate any concerns other states or trade associations may have with response to such a departure from globally accepted practices," the risk-assessment document says.

Canada is one of over 190 members of the International Civil Aviation Organization and has agreed to follow its recommended practices, including evaluating pilots twice a year.

Greg McConnell, chairman of the pilots association, said the changes are [pushing](#) Canada's aviation safety system onto the industry itself.

"I think it's very, very important that people understand we are getting closer to self-regulation all the time." he said in an interview. ["It's just more cutting, more dismantling of the safety net."](#)

The risk assessment says Transport Canada is having a problem hiring and retaining properly qualified inspectors. A spokesman with the pilots association said none of its inspectors will likely lose their job because of the changes. The documents say transferring the responsibility is a "low risk."

Transport Minister Marc Garneau and officials in his department weren't available for an interview. The department says in an email it is focusing its oversight on areas of greater risk.

"Data has demonstrated that over the past five years, approved check pilots have [had a very low failure rate](#) (less than 0.2 per cent) when being monitored by Transport Canada. The department is confident that approved check pilots are exercising their delegation of authority properly," it says.

Conservative MP Kelly Block, a vice-chair on the Commons transport committee, said she's concerned the changes weren't brought to the committee during its study on aviation safety.

"When a parliamentary committee is seized with a topic and the department doesn't disclose this kind of relevant information ... I think that's very disturbing."

The committee recommended the government establish targets for more on-site safety inspections as opposed [to auditing the safety management systems of the airlines](#). Transport Canada replied to the suggestion earlier this month, saying it recognizes the importance of a mix of systems-based inspections and spot checks. New Democrat MP Robert Aubin, the committee's other vice-chair, said the decision was "curious" because Transport Canada said it was doing more oversight, not less.

"I have concerns if the pilots who evaluate their pilots are not evaluated by Transport Canada. We have to have the same standards," he said in an interview. "We have to increase the resources at Transport Canada to make sure we can do that job." Liberal MP Judy Sgro, the committee's chairwoman, was not available for an interview.

The documents say putting additional inspection burdens on the airlines means extra human and financial tolls on them. Block said the committee heard airlines already operate on tight financial margins and she believes they are just as concerned about safety.

"That's what you're left with, is believing that perhaps that (consumer) costs will have to go up in order to ensure that they are operating in a safe environment." WestJet and Air Canada declined comment on the pending changes.

## **Probe after clipboard sucked into Jetstar engine**

Ground-handling firm Aerocare is investigating an incident where a clipboard **left on an engine cowling** was sucked into the engine of a Jetstar plane bound for Sydney.

A union said it was "an unfathomable incident" which Jetstar was also investigating.

The head of E Tu aviation, Kelvin Ellis, said his union was "shocked and concerned to hear about this incident which is unacceptable and should never have happened".

Jetstar says the aircraft with 84 passengers on board had to turn around and return to Auckland 30 minutes into the flight. It has begun an inquiry after the incident on Saturday but would not comment on Aerocare's role.

"The flight took off and was operating normally; the pilots returned to the airport as a precaution, and had a normal landing," said a Jetstar spokesman.



Ellis has questioned whether Aerocare's [training and split shifts had led to fatigue and contributed to the incident](#).

He said [safety checks broke down](#) at several points around the flight - the clipboard being left there in the first place, the failure to notice it on an engineering walkaround and by a staff member on the ramp wearing the headset who dispatches the aircraft.

Aerocare does ground handling for several airlines in New Zealand and says it has one of the best safety records in this region.

A spokesman said both the leading hand and dispatcher said fatigue was not a factor in the event.

Neither had worked split shifts on the day.

"Aerocare is working with New Zealand aviation authorities, and Jetstar, to understand how this one-off incident occurred.

"Aerocare does not force any employee to work a split shift. Unlike other baggage-handling companies, split shifts are at the discretion of employees and not the company. Any suggestion that these workers were therefore fatigued is wrong."

Aerocare says it has handled more than one million flights in its 25-year history and has never been fined or sanctioned for any safety incident.

Ellis said there could be under-reporting of incidents, which was common in casualized, low-pay work environments.

Aerocare says its staff in New Zealand are all permanent.

## **FAA Bulletin Clarifies Runway Status Light Procedures**



The FAA has issued Safety Alert for Pilots (SAFO) 17011 to ensure pilots and airport personnel are aware of the correct procedures concerning runway status lights (RWSLs), a fully automated system intended to prevent runway collisions. It cited several instances in which pilots [have ignored the illuminated red in-pavement lights](#) when issued a clearance to cross or take off from that runway.

Installed at nearly 20 of the nation's busiest airports, RWSLs integrate airport lighting equipment with approach and surface surveillance radar systems to provide aircraft crews [and vehicle drivers](#) a visual signal indicating when it is unsafe to enter or cross a runway and begin or continue a takeoff. Illuminated RWSLs mean aircraft or vehicles must stop or remain stopped and their operators should contact ATC for further direction. The RWSL system operates independently of ATC and "controllers do not have any indication of when the...lights are illuminated."

According to the pilot reference guide for RWSLs, whenever a pilot observes the red lights of the runway entrance lights, that pilot should stop at the hold line or along the taxiway path and remain stopped. The pilot should then contact ATC for resolution if the clearance is in conflict with the lights. [Under no circumstances](#) should pilots proceed without both an ATC clearance and visual confirmation that runway status lights are not illuminated.

## **Safety Alerts Focus On Runways**

The FAA and NTSB both issued safety alerts recently that warn pilots to use proper procedures when operating on runways. The NTSB (PDF) cites several accidents when pilots chose an intersection takeoff to save time, and then lost power. In each case, if the pilot had used the entire available runway, there would have been room for a safe landing straight ahead. [Instead, all three aircraft crashed](#), and two people were killed. The safety board advises pilots to use all available runway length to increase the margin of safety on every takeoff. The FAA's Safety Alert for Pilots (PDF) also concerns runway operations, reminding pilots [and airport workers](#) about the correct procedures for using runway status lights.

The lights are a fully automated system intended to prevent runway collisions, the FAA says, but it cited several instances when pilots ignored the lights after they were issued a clearance to cross or take off from that runway. The FAA says the RWSL system operates independently from ATC, and controllers have no information regarding the status of the lights.

Illuminated RWSLs mean aircraft should stop or remain stopped, inform ATC that the RWSLs are illuminated and wait for further direction. “Failure to comply with illuminated red in-pavement RWSL lights may result in a high-risk collision Runway Incursion event,” the FAA said.

<https://youtu.be/-UFY6ewJGZA>

<https://www.nts.gov/safety/safety-alerts/Documents/SA-071.pdf>

[https://content.govdelivery.com/attachments/USAF/2017/10/20/file\\_attachments/899878/SAFO17011.pdf](https://content.govdelivery.com/attachments/USAF/2017/10/20/file_attachments/899878/SAFO17011.pdf)

## **Five important safety actions for helicopter pilots**

After analyzing dozens of helicopter accidents that resulted in fatalities for pilots and passengers, the US Helicopter Safety Team (USHST) has circulated what it says are the five **vital action items** for pilots that will improve safe operations. Focusing pilots on these solutions will allow them to make better choices before and during their flights, said USHST; the **facts show that failure** in these areas has resulted in lives being lost.



**The five actions recommended by the USHST are:**

### **1. Take time for your walk around**

The pilot in command is responsible for determining the airworthiness of the aircraft he or she is operating. An adequate preflight inspection and final walk around is key to determining the condition of an aircraft prior to flight. In addition, post-flight inspection can help to identify issues prior to the next flight. The USHST believes that pilots would benefit from better guidance on how and why to conduct these inspections, as well as increased attention to their importance.

## 2. Communicate risk issues in the cockpit

The flight environment is often dynamic and not every contingency can be anticipated or scripted in advance. The pilot-in-command is ultimately responsible for the safety of a flight - however, non-flying crew and passengers can and should work with the pilot to ensure safety. When unexpected changes are encountered, it is paramount that the pilot and crewmembers/passengers try to detect the elevation of risk, communicate it to each other, and collectively work through a reasonable resolution or mitigation. The USHST believes that effective practices are needed for each stage in the process - detection, communication and decision.

## 3. Get solid training for make and model transitions

Transition training in the helicopter community is not uniformly applied, and this is leading to accidents because of unfamiliarity with airframe and/or equipment. The USHST believes that documentation related to helicopter transition training can be developed into a new, unified guide that would offer recommended practices and a 'toolkit' to support standardized use.

## 4. Understand the hazards of over-the-counter medications

Because over-the-counter medications are readily available, pilots frequently underestimate the deleterious effects and the impairment caused by these sedating drugs. In spite of specific federal regulations and education efforts regarding flying while impaired, over-the-counter medication usage by pilots remains a factor in 10 to 13 per cent of aircraft accidents. The USHST believes that the helicopter community needs an increased awareness of the potentially disastrous results of operating an aircraft while taking these medications.

## 5. Make a safe attitude your overriding priority

Safety in the aviation world can be defined in many ways. From the reactive point of view, safety essentially means a lack of accidents, an absence of injuries, and a general environment where things don't go wrong. From the proactive point of view, this environment doesn't exist for any consistent amount of time unless certain safety-related active principles are put in place and specific safety attitudes are fostered and strengthened. Whether we are strengthening a person's safety attitude, bolstering a team's safety convictions, or nurturing an entire safety culture, focusing every member of an aviation team at every level on clear and tangible convictions needs to be a central goal.

The USHST said it believes that a more [widespread culture of safety](#) can be developed if the principles are straightforward and relatable to individuals. The Team added: "Your flight decisions need to be determined by safe actions. You need to take a proactive approach to solving safety issues. You must never carry out any unsafe actions or unprofessional behaviors. You should be [continually looking](#) for new safety knowledge and information. You need to find ways to invest in and use technology that improves safety."

## [Finnair Is Weighing Passengers at Check-In. Here's Why](#)

It needs to collect data on 2,000 passengers.

Scandinavian countries have a reputation to maintain as pioneers of social experiments (six-hour workdays, national basic income), and the latest data-gathering test in Finland is no exception. Finnair announced an experiment this week to weigh passengers before they board their plane.

The new initiative isn't as triggering as it first seems. In fact, Finnair is collecting data on customers' weights [to better estimate fuel requirements](#) and hopefully, decrease operating costs. Many European airlines, including Finnair, use estimates from the European Aviation Safety Agency (EASA) to calculate the correlation between [total weight, fuel, and safety](#). EASA last collected data in 2009, and Finnair wants to check that the weight estimates are still accurate and reflect its main customer base.

The goal is to collect the weights of 2,000 passengers, and so far this week, Finnair has asked 180 passengers to participate. The process is entirely voluntary and anonymous, and occurs at check-in. The passengers are being asked to step on the scale with their luggage, and according to the airline, feedback so far has been positive.



Right now, the experiments are being conducted at Helsinki airport, but Finnair hopes to gather data on different routes and plans to continue the project into 2018 to account for seasonal changes (those bulky down coats aren't light, after all).

According to figures reported in The Telegraph, the current passenger weights based on the EASA's estimates are 84.6 kilograms for men (186.5 pounds) and 66.5 kilograms (146.6 pounds) for women.

The collected customer data might be used to help the airline strategize the expansion of its route network, as weight helps forecasts payloads and fuel requirements. Finnair's regular international destinations include New York, London, and Paris, with seasonal flights to Miami, Chicago, and San Francisco. In January, it was named one of the top 20 safest airlines in the world.

<https://www.cnbc.com/2017/11/02/forget-your-checked-luggage-this-airline-is-weighing-passengers.html>

## **Embry-Riddle Dean Sees Fewer, Better-Trained Techs Per Future Aircraft**

Average age of technicians currently working is 51 years old.

Kenneth Witcher, dean of the college of aeronautics at Embry-Riddle Aeronautical University, predicts the maintenance workforce of the future will have **fewer but much better trained employees** for each aircraft supported. He believes technology, in design of aircraft and engines, in troubleshooting, scheduling and performing maintenance and in training maintenance workers, will permit **a smaller ratio** of techs per aircraft-year. But these future techs will have to be able to handle all the new tools and systems.



Witcher is hearing from Embry-Riddle's industry advisory board about a major shortfall in aviation techs by 2030, given the average age of 51 years for today's technicians. [The possible shortfall is global](#), not confined to the U.S. or any region. And he is seeing signs that the shortfall is approaching even now, as firms say they have difficulty finding people with the right skills, certifications and even aptitudes for maintenance work. He cites estimates that, even if every maintenance training school were filled to capacity, it would [not be enough](#) to close the gap, at least at the current ratio of mechanics per aircraft.

The good news is that maintaining that ratio will not be necessary. New aircraft and engines are designed to need less maintenance. Big data and new analytic tools can shift inefficient unscheduled maintenance to more efficient scheduled work, which requires fewer man-hours per repair. Better scheduling systems and better diagnostics should also reduce the MRO burden per aircraft.

Witcher says augmented reality tools are already being used in training technicians. He believes they will be used in operations as well. ["The maintenance worker will put on a set of glasses, which will display all the technical data and torque sequences,"](#) leading to much greater efficiency.

The Embry-Riddle Dean is seeing signs that both the maintenance industry and potential maintenance workers understand the leaner but more demanding future of aircraft maintenance. Embry-Riddle's Bachelor of Science degree in maintenance, which at 120 credit hours goes way beyond the core courses needed for certification, has doubled its enrollment from 800 to nearly 1,600 students in six years. Witcher says the university did not plan or seek the rapid increase, it just happened due to the demands of students. Now the university has launched a master's degree focused not on management, but on [the technical side of maintenance](#). The program immediately attracted 60 candidates.

"The industry is changing its expectations, it wants more formal education," Witcher says. "Twenty-five years ago, technicians just had to be able to read a technical order and turn a wrench and know some basic theory. Now technicians are [managing systems and interpreting diagnostics.](#)"

## **AIN's The Human Factor, Episode 06: The Perils of Hypoxia**

Pilot George Braly recalls a flight in which his portable oxygen line becomes kinked and he ultimately loses consciousness. Braly is awakened by ATC and is able to increase the oxygen flow and safely descend from the high-altitude flight.

In this episode **AIN** delves into the issue of hypoxia by examining both portable and built-in oxygen systems. Additionally we discuss the FAA regulations that require one pilot when flying in a pressurized aircraft above 41,000 to use an oxygen mask at all times. [Studies have shown that 82 percent of business aircraft pilots openly disregard this rule](#), and this episode discusses the human factors involved in oxygen mask use on long flights and possible solutions to this problem.



[Listen here.](#)

## **Episode 07: Fly-by-wire Failure, Part 1**

On Oct. 7, 2008, Qantas Flight 72 was flying over the Indian Ocean from Singapore to Perth, Australia. Kevin Sullivan, pilot-in-command of the Airbus A330, was flying on autopilot at 37,000 feet when suddenly warnings started sounding throughout the cockpit; the primary flight control computers were malfunctioning. The aircraft began to pitch up, and Sullivan realized he was just another passenger, for a short time unable to control the errant Airbus. After regaining control of the A330, Sullivan then had to decide whether to make an emergency landing at the nearest airport, the military field at Learmonth, or continue another hour and a half to Perth.

In this episode of **AIN's** *The Human Factor*, Sullivan recounts how he was able to identify the issues affecting the A330's fly-by-wire flight controls and minimize damage while planning how to keep his 315 passengers safe.

## [Australian Transport Safety Bureau Report](#)

*Stay tuned for Part 2 of this episode to be released on November 15.*

In this episode we will hear from:

Kevin Sullivan, pilot-in-command of the Airbus A330

Bill Palmer, author and A330 pilot

Gary Rower, A330 pilot, flight instructor and airshow performer

Malcolm Yeo, retired pilot and passenger on Qantas Flight 72

Topics in this episode include:

Primary flight control computer

Fly-by-wire system operation

Equipment malfunction

Autopilot versus manual flying

[Read When Automation Fails, Qantas Pilot Employs Military Training.](#)

[https://www.atsb.gov.au/publications/investigation\\_reports/2008/air/ao-2008-070.aspx](https://www.atsb.gov.au/publications/investigation_reports/2008/air/ao-2008-070.aspx)

<https://soundcloud.com/the-human-factor-ain>

## **The 747 flies into the sunset**

Years ago, famed British architect Norman Foster proclaimed that his favorite building of the 20th century was an PLANE -- the Boeing 747. Now, the jumbo jet he so honored is on [its final approach](#) as a passenger plane. Kris Van Kleave gives us the view from the cockpit:



<https://www.cbsnews.com/news/the-747-flies-into-the-sunset/>

## **Surgery Safer in Afternoon because of Circadian Rhythm, Study Suggests**

Undergoing heart surgery in the afternoon may be far safer than in the morning because **it synchs up with the body's circadian rhythm**, reports *The Telegraph*.

A review by French researchers of nearly 600 people who underwent heart valve replacements, found that people who had morning operations **were twice as likely** to suffer a major cardiac event, in the following 500 days.

Only nine per cent of afternoon patients suffered a heart attack, heart failure, or death from heart disease, in the follow-up period, in contrast to 18 per cent of morning patients, the study in *The Lancet* showed.



[Get the full story at www.telegraph.co.uk](http://www.telegraph.co.uk)

## **'Human factors' science turns to tackle improving the level of care in hospitals**

Dr Rhys Thomas is one of Australia's only medical human factors fellows.

It is hoped a study looking into complex human factors which can affect the medical treatment of patients will improve the provision of care in hospitals.

Human factors is an [area of science](#) covering how people and systems work together, and is often referred to as ergonomics.

Those systems can range from how equipment is used, to how guidelines and rosters impact staff.

It is particularly pertinent to industries [where systems and people work closely together](#) to ensure the safety of others, such as aviation and medicine.

Research by one of Australia's only fellows studying human factors in medicine, Rhys Thomas, is underway in the New South Wales Hunter region.

He is studying how the health sector can better understand and improve the factors influencing patient care.

"There's been technology improvements, and it's become increasingly apparent that these things are extraordinarily complex," Dr Thomas said.

"Then you add in all the various social factors, so this growing area of interest and research [leads] into how we can best design and look at these complex systems.

["Humans have various strengths and weaknesses,](#) and we need to design these systems to make them work as well as possible with human involvement, but also to ensure the welfare of the humans that are involved in that.

"[It's about] taking a few steps back and looking at the system, and trying to work out what were the conditions within the organization, or within the guidelines, or within the working environment that meant this person made this decision that then resulted in a bad outcome."



## Human factors not just about equipment

Dr Thomas said in the medical industry, patient care could often be influenced by how people interacted with complex pieces of equipment.

Nestled within Newcastle's John Hunter Hospital is a simulation laboratory, which is used to teach staff in mock training scenarios.

Dr Thomas said equipment must be thoroughly tested for its usability.

"Given the strengths and weaknesses of how humans think and behave, it's possible to design equipment in ways that take that into account," Dr Thomas said.

"[We should aim to make] it easy for the humans operating the equipment to do the right thing, make it difficult for them to do the wrong thing, and make it very difficult for them to do the catastrophic thing.

"It's not just equipment — it can be a guideline [that's] poorly designed, or a roster can be poorly designed.

"Unfortunately, some of these things don't get identified until after an incident.

"We need to learn from those incidents."

## Strengthening care for patients

While there are a raft of experts working in the broader human factors field, it is hoped Dr Thomas's eventual findings could be used in health districts across the country.

"There is quite a lot of data [showing] there is a significant amount of patient harm that results from breakdowns in these complex systems. They're multi-factorial and, on top of that, often the practitioners involved are also very upset, and stressed, and devastated by these outcomes," Dr Thomas said.

"That's why it's important to remember that a key part of the human factors discipline is not just maintaining the system as working well, but also the people within the system — that their wellbeing and welfare is looked after as well.

"Patients should be encouraged to be excited about this idea, because there are improvements to be made."

## **A veteran's car, and a son's keepsake**

In 2003 Army 1st Lt. Jonathan Rozier died in Iraq. His son, Justin, was nine months old. Today, 15-year-old Justin **cherishes anything that used to belong to his dad**, which is why he thought it would be so cool to have a car he owned, like the '99 Toyota Celica convertible his mom had to sell after Jonathan's death. Steve Hartman reports the heartwarming story about where the search for Justin's dad's car ended up.



<https://www.cbsnews.com/videos/a-veterans-car-and-a-sons-keepsake/>