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THE FLOATING WORLD

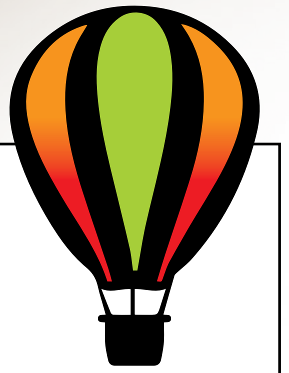
Hot-air ballooning is a unique form of aviation. Some challenges are ballooning's alone, while other safety aspects are familiar to any aviation operator.

How's this for a safety concept? Weave a giant basket, big enough for up to 20 people, and then put it under a huge bag that you inflate by burning compressed flammable gas. Ascend into the sky. You've got no steering and subtle control over climb and descent.

Under the circumstances, hot air ballooning has an enviable record, by some measures comparable with air transport. Fatalities are very rare in both. But analysing accidents against hours flown show that non-dirigible lighter-than-air flight also has unique safety challenges.

Photo sources: ThinkStock, Andrew Chapman, Joanna Pagan

Balloon basics



Hot air balloons achieve lift by heating the air inside the envelope (the overhead canopy of the whole balloon) using liquid petroleum gas (LPG) from burners. The heated air becomes less dense and therefore lighter. Cooling the air in the envelope—or letting some out—makes the balloon descend.

The balloon basket, which is connected to the envelope, carries the pilot and passengers. Up to 20 passengers can be carried in Australian commercial operations. However, most operators limit themselves to about 16 passengers. Privately operated balloons are smaller—some carry only one person.

The envelope is initially inflated by cold air, usually generated by a large fan, or fans, on the ground. As the envelope begins to inflate, the burners blow hot air into the balloon.

A balloon's descent can also be controlled with a parachute vent at the top of the envelope (or a smart vent if one is installed) by pulling down on their control lines. The parachute vent can be opened and closed while airborne, but a smart vent is normally only used for touch down, because it needs to be re-seated manually. >

Data analysis suggests that in Australia, general aviation (GA) has the highest number of accidents, followed by commercial air transport and the balloon industry. However, taking into account hours flown, the balloon sector has the highest accident rate, by quite some margin, followed by GA, and then commercial air transport. Between 2007 and 2012, the average balloon accident rate per 1000 hours was 0.356; for GA it was 0.086; and for commercial air transport it was 0.016.

Balloon accident numbers are low enough to jump around from year to year—no more than five were recorded in any single year between 2007 and 2012, and that year had only one recorded accident. But figures from the US confirm the general message of Australian statistics—and suggest a divergence between accident rates and fatal accident rates.

The US National Transportation Safety Board found 0.075 per cent of ballooning accidents were fatal between 2002 and 2012. The equivalent figure for air transport was 0.06 per cent.

In Australia, there were no hot air balloon deaths between 1989, when 12 people died; and 2013, when a woman was killed in a ground accident. (See breakout: *Spiralling danger*.)

In short: the data suggest you are much more likely to have some sort of accident in a balloon than in a commercial aeroplane, but it is likely to be minor, or at any rate, survivable. The odds of your accident being fatal are close to the impressive safety record of air transport.

What happens in a balloon crash? A 2013 study of US commercial balloon crashes by the Johns Hopkins Bloomberg School of Public Health found most (81 per cent) occurred during landing; 65 per cent involved hard landings. Collisions: with trees, buildings, power lines or the ground, contributed to 50 per cent of serious injuries and all of the five fatalities in the 78 crashes between 2000 and 2011.

Co-author Dr Susan P. Baker said: 'We know over half the serious injuries we reviewed in our study were lower extremity fractures sustained during landings. Potential strategies for reducing landing forces include cushioning the bottom of the basket, or employing crash-worthy auxiliary crew seats during landings. Similarly, the use of restraint systems and the use of mandatory flight helmets could influence crash outcomes.'

Collisions: with trees, buildings, power lines or the ground, contributed to 50 per cent of serious injuries...

The dangers—fuel, fatigue and flight

Hot air ballooning is both the oldest form of aviation and a relatively new aerial activity. The first person to leave the Earth in an aircraft was Étienne Montgolfier, who made a tethered ascent in 1783. But almost as soon as it was invented the hot air balloon faded from the aviation scene; carrying fire and fuel aloft was a daunting prospect with 18th century technology. Ed Yost invented modern hot-air balloons in the mid-1950s. He made the first free flight of a gas-powered hot air balloon on 22 October 1960.

> Balloon basics (cont.)

Two rotation vents on either side of the envelope control the rotation of the balloon to left or right, for passenger viewing, or for alignment when landing. The pilot operates these using rotation vent lines. The vents do not steer the balloon. A change of direction is usually achieved by the balloon ascending or descending to a different altitude. Even very light winds can flow in different directions with only a small change in altitude. This is why most balloon flights are made in the early morning, as it is the best time of day for light and stable winds.

CASA requires balloon pilots in Australia who carry paying passengers to have a commercial pilot (balloon) licence, similar in its extra stringency to a commercial pilot licence for heavier-than-air aircraft, but with unique requirements for balloons. Balloon operators with flying training approval on their air operators' certificates do the training, and CASA issues the licence.

Private balloon pilot certificates, which can only be used for private flying, are issued by the Australian Ballooning Federation (ABF). A student pilot must meet training requirements with an ABF instructor and pass a test for a private certificate with an approved ABF examiner.

An aspect of ballooning that is often overshadowed by their blissful image of silent scenic floating is that a hot air balloon is a powered aircraft. It may not have an engine but it uses fuel—liquefied petroleum gas (LPG)—to create the energy it uses to fly.

Balloons store their LPG in cylinders pressurised to 100psi. This produces a flame up to three metres long at the burner, and any flame from a leak can be expected to be of a similar size.

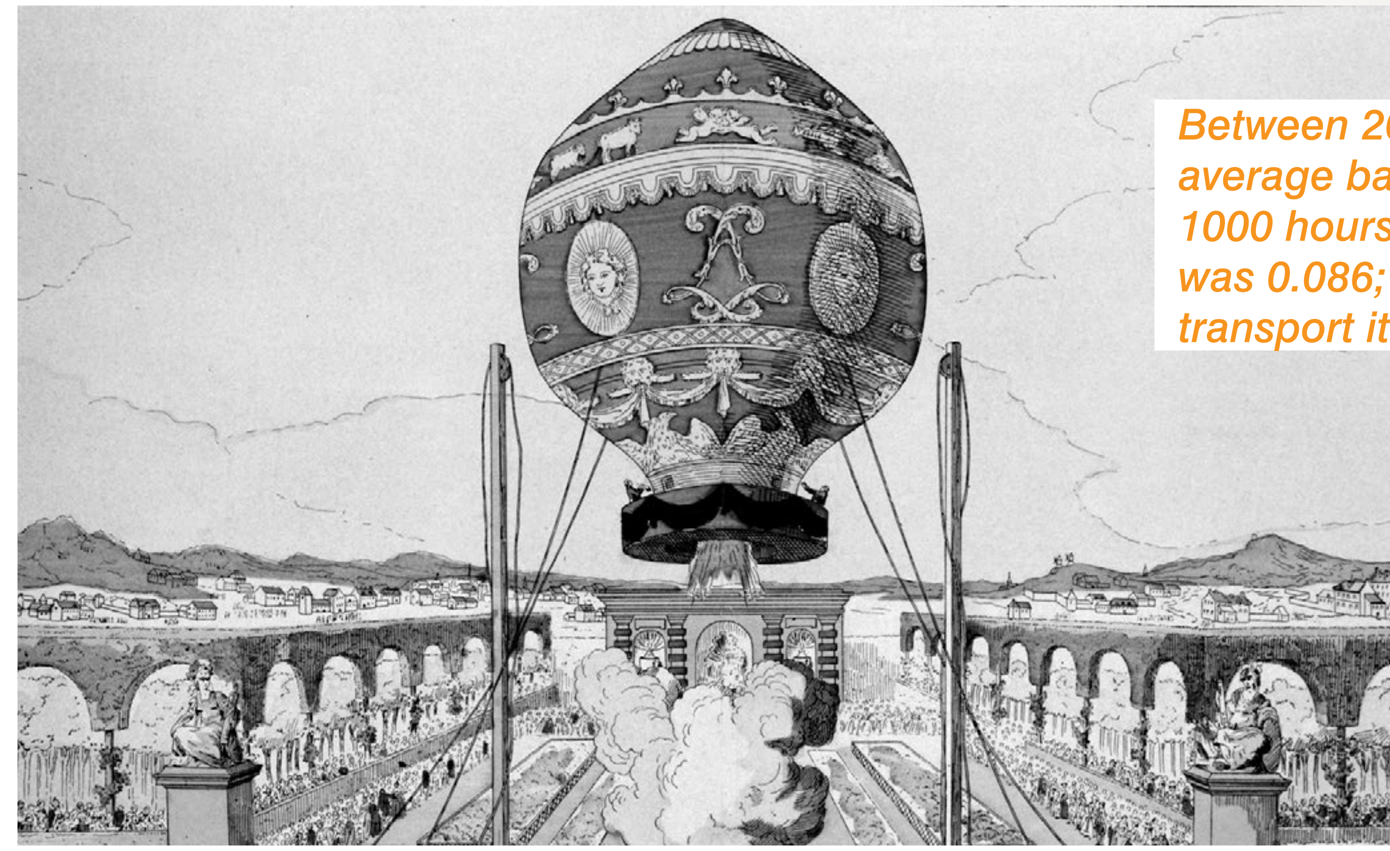
'Like any powered aircraft, it combines fuel and flame, and a balloon pilot, like any pilot, has to be mindful of this,' says CASA balloon flying operations inspector, Don Campbell.

CASA's position is that hot-air ballooning has to play by the same safety rules as any other type of aviation. 'On some occasions balloon operators have said that they are just an adventure ride,' says Campbell. 'CASA inspectors point out that they are carrying people for reward, and therefore it is a commercial operation and must abide by the relevant aviation rules.'

Fatigue is a significant potential element for commercial balloon operators to manage, Campbell says.

'Ballooning is an early morning event. Pilots are up around 3–4am to start getting meteorological information. It must have an effect on them,' he says. Campbell notes that some commercial balloon operators use fatigue risk management systems (FRMS) to control this hazard, but also points out that balloon pilots generally do not fly as constantly as commercial fixed-wing pilots and have less chance to become habituated to early starts. Breaks of several weeks between commercial flights are common.

Flight Briefing and Information is another potential safety weakness, Campbell thinks. 'Balloon pilots are really required to get the weather information and notams like any other pilot. They should be reading those constantly.'



A Montgolfier balloon makes a tethered ascent circa 1783

Between 2007 and 2012, the average balloon accident rate per 1000 hours was 0.356; for GA it was 0.086; and for commercial air transport it was 0.016.

While many pilots get their primary information from other meteorological sources, such as the Bureau of Meteorology, it is still vital to read notams for the non-weather information they contain, such as aircraft movements, restrictions and obstacles.

One aspect of balloon operations not immediately apparent to heavier than air pilots is that the balloon's ground crew is also important to safety of the flight. 'Ground crew similarly need relevant training applicable to their safety responsibilities' says Campbell. As an example he points to the Luxor, Egypt crash of 2013, which killed 19 people. Initial and unofficial reports attribute that accident to a mooring line, which dislodged a gas bottle fitting, causing gas to leak and burst into flame.

Ed Yost invented modern hot-air balloons in the mid-1950s. He made the first free flight of a gas-powered hot air balloon on 22 October 1960.

'... We have very good external and internal controls, which all lead to the creation of a generalised safety culture.'

Feet on the ground—safety briefings and culture

The death of a woman in July 2013 in a ground accident involving a balloon's cold air inflation fan has also raised the issue of ballooning passenger safety briefings and their adequacy.

The Australian Transport Safety Bureau's investigation was still underway at the time of writing but soon after the accident the bureau issued a safety advisory notice that said: 'The ATSB urges all balloon operators to consider this alert in the context of their operations, and to review and modify their procedures as necessary in response to reduce risk.'

Campbell says crowd control is the key to safety on the ground. 'My preference is that operators keep all their passengers in one area, so that they are in the sight of at least one of the ground crew. Crowd control is a vital part of the operation.'

Director of Picture This Ballooning and spokesperson for the Professional Ballooning Association of Australia, Damian Crock, says, 'The safety briefing is typically two to three minutes long and goes through landing positions, stowing of gear, the bending of the knees if there is going to be a rough landing, and holding on to safety handles. It's just ensuring that people are comfortable in the environment that they are in.'

In addition, Crock says, the special occasion nature of balloon flights makes passengers more responsive to safety briefings than they would be if they were on yet another airline flight. Picture This takes advantage of the novelty factor to offer three briefings: one when the passengers are collected from their accommodation, one before inflation and a final briefing before take off.

'We are a very well regulated industry,' he says. 'We have strict insurance regimes … which demand safety seminars. We have very good external and internal controls, which all lead to the creation of a generalised safety culture.'

Safety culture must cover the entire operation, Crock says, noting that Picture This pays attention to the safety of ground transport for passengers by ensuring drivers and vehicles meet, or exceed, all relevant standards.

The ballooning industry's safety culture will become more distinct when CASA introduces a new suite of regulations, CASR Part 131, to cover ballooning. Under Part 131, commercial balloon operators will be required to adopt a safety management system, formalising and reinforcing what it is hoped the best operators are already doing to manage the risks.

Flight control—a subtle game

But even with appropriate regulations, enforcement and strong safety culture, the unavoidable fact of ballooning life is that a strong gust of wind at the wrong time can mean misfortune. In the past two years, balloons have been filmed colliding with objects, such as the Treasury building in Canberra, trees in Western Australia, and most disturbingly, high-tension electrical lines, at the Albuquerque International Balloon Fiesta in August 2013.

Balloons travel at whatever pace the wind is blowing. Usually this means they travel slowly (although high altitude balloons in jetstream winds have attained ground speeds of more than 200 knots). But they also manoeuvre slowly. A 210,000 cubic foot balloon displaces more than 7.3 tonnes of air (on a standard day), and will have a similar momentum. Generally, a balloon will take up to about 30 seconds, depending on load and ambient temperature, to respond to a burner input. Balloons respond faster to the parachute valve being opened, which vents hot air from the envelope, and fastest of all to the 'rip valve', which puts the balloon into a fast but survivable descent, in some designs at the cost of damage to the envelope. This leads to a dilemma for balloon pilots facing an obstacle—fire the burners, and take a chance on clearing it; or rip, be more likely to avoid the obstacle, but have to account for a possible rough landing and other damage.

In April 2011, a balloon flying in Western Australia faced exactly this challenge. The pilot, seeing power lines 'a mile away', considered there would be 'plenty of time to climb'. However, after

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initiating one burner for the ascent, the balloon didn't respond. Both burners were then operated for about ten seconds, but the balloon continued to be unresponsive. With the power lines fast approaching, the pilot decided to 'rip-out' and implemented the rapid deflation system, from the maximum altitude of about 50 feet, resulting in a 'hard landing' and injuries to those aboard. The ATSB report into the incident found the 'pilot's initiation of the emergency descent and landing probably avoided an airborne collision with power lines.'

Less than a year later, a balloon of the same size hit power lines in Carterton, New Zealand, killing all 11 people on board.

The New Zealand Transport Accident Investigation Commission found: 'The accident would have been potentially survivable if an immediate descent had been initiated when the pilot first realised that the balloon was likely to hit the power lines. For some reason the pilot decided to try to out-climb the power lines instead. It is possible that he thought there was sufficient time or distance to enable the balloon to out-climb the power lines. If so, this comes down to a simple error in judgement.'

The Carterton and Luxor crashes have raised a controversial topic among professional balloonists. Should passengers be briefed in emergency use of some balloon flight controls, such as the fast-deflation system? Advocates say accidents such as Luxor and Carterton might have been prevented, or made less severe, if a passenger were able to use the system to prevent the balloon from climbing rapidly, only to plunge back to earth. Sceptics say that in no other type of aircraft are passengers expected to take control in an emergency.

The New Zealand TAIC report said: 'There is an argument that had the pilot become incapacitated by the initial electrical arcing, a passenger could have descended the balloon using the emergency deflation cord, had they been instructed in its use. This would need to be balanced with the risk of a passenger panicking and pulling the cord at an inappropriate time.'

Death on the Nile—the Luxor crash

In February 2013, as the sun rose over the Valley of the Kings in Luxor, Egypt, 20 tourists, from Britain, Hong Kong, Japan, France and Hungary, were about to land after an hour-long flight over the historic ruins. With the balloon just 10 feet away from touchdown, ground crews pulled on mooring lines to help guide the huge craft down.

There is no official report on what happened next, and given the current political situation in Egypt, it may be some time before one appears. Other sources said that as the ground crew hauled the balloon down, one of the mooring ropes cut through gas cylinder leads. Fire quickly followed. One passenger and the pilot jumped immediately, from about 16 feet above ground. They survived, although the pilot had burns to 70 per cent of his body. Seven others jumped later, as the balloon climbed rapidly. All these people died. The other passengers probably lived a little longer, until the balloon fell back to earth after an explosion, thought to be of a gas cylinder, took place about 1000 feet above the ground. Whether they were killed by impact or fire is unclear.

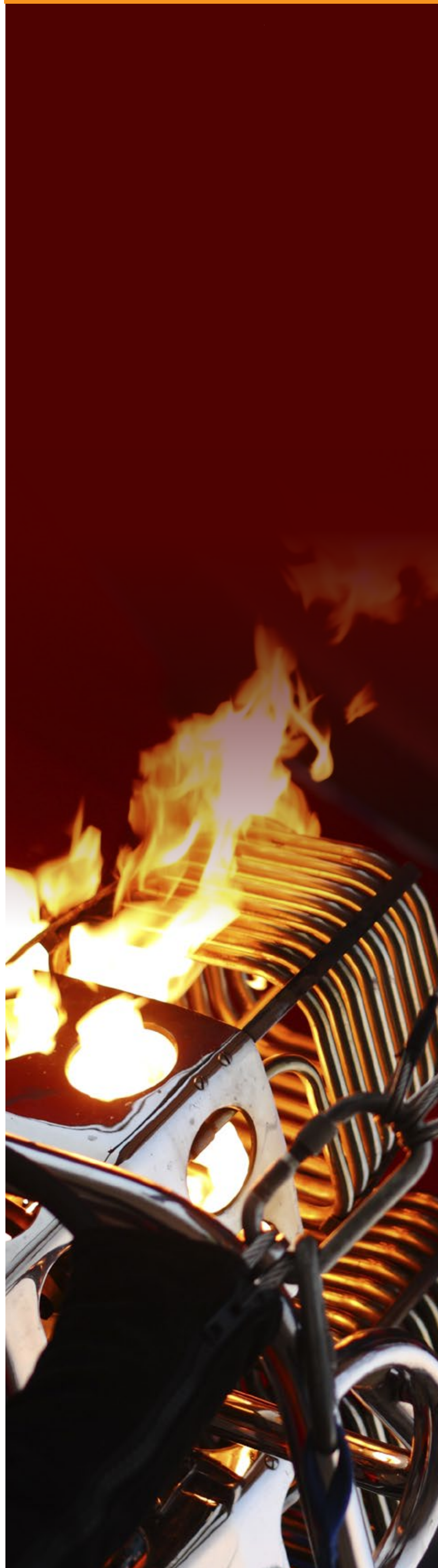
Egypt's civil aviation minister told Bloomberg News the pilot had jumped from the basket without shutting off the gas valve, leaving the remaining passengers to their fate.

The Egyptian Civil Aviation Authority announced the suspension of balloon flights and an investigation into the crash. Two months later, balloon flights resumed, with new regulations—calling for further training of pilots and ground crews, and constant monitoring of how each balloon operator maintained gas fittings to ensure compliance with the manufacturer's standards.

It was the second round of safety–related actions for the Egyptian ballooning industry. The first was prompted by a series of accidents, including one in 2009 where 16 tourists were injured. The first reforms had included a six-month grounding intended to allow pilots to undertake extra training. Other reforms included adopting a single launch area and a limit of eight balloons aloft at any one time.

However, incidents continued. The balloon involved in the Luxor crash was filmed three years earlier, in 2010, falling into the Nile, crashing into a boat and injuring several occupants.

Further information/link:
The crashed balloon's earlier accident in the River Nile



Spiralling danger

A tragic accident in central Australia is a grim reminder that balloon safety, like that of any aircraft, starts on the ground.

In the early hours of 13 July 2013, near Alice Springs in the Northern Territory, a flight by local operator, Outback Ballooning, was preparing to take to the skies. After rolling out the balloon, the ground crew began to inflate the envelope with cold air blown into it by ground fans. This is carried out to semi-inflate the balloon's fabric envelope to provide enough room for burners to blast in the hot air in that gives the balloon lift.

All went well until one of the passengers approached the basket to climb in. A long scarf she was wearing was drawn into the fan and became entangled in the blades. Alice Springs police officer, Drew Slape, told the NT News that 'sudden force' was applied to the victim's neck, leaving her with 'serious neck and spinal injuries.' The 35 year-old woman from Sydney died days later in hospital.

An Australian Transport Safety Bureau (ATSB) investigation is still pending; however, the Bureau issued an urgent safety advisory notice (SAN) to all operators in Australia advising 'balloon operators to review their risk controls in relation to the safety of cold-air inflation fans, especially in relation to passenger proximity to operating fans, and the security of loose items, such as passenger clothing.'

On its website, Outback Ballooning, which had come under new management just days before the accident, encouraged passengers to wear 'suitable clothing', but did not go onto to state what 'suitable clothing' should, and more poignantly should not, include. Until this accident, Outback Ballooning had had a reassuring safety record in its 30 years of operating.

Director of Melbourne-based Picture This Ballooning, Damian Crock, says a strong safety culture in Australian ballooning sets it apart from lighter-than-air flight in other parts of the world.

'The incidents and accidents in hot air ballooning in Australia are few and far between.' Crock says. 'This is due to very careful consideration of the three major risks: flying in ideal conditions, having extremely well-maintained gear and having a well-trained flight crew,' he says. 'I think we have a good record for that nationally.'

Crock, who is also a spokesperson for the Professional Ballooning Association of Australia, says his company dedicates part of its safety briefing to cater specifically for cold-inflation fans.

'It's a very thorough, very professional and required part of the operation,' he says. 'The pilot will call all passengers to attention and require full eye contact. The safety briefing is typically 2–3 minutes long and goes through landing positions, stowing of gear, the bending of the knees if there is going to be a rough landing and the holding on to safety handles,' he says. The pilot also informs the passengers of the 'fan with large blades that draws in air from the back and emits air from the front' and asks passengers to 'give the fan a wide berth. We also have safety cones around the fan,' Crock says.

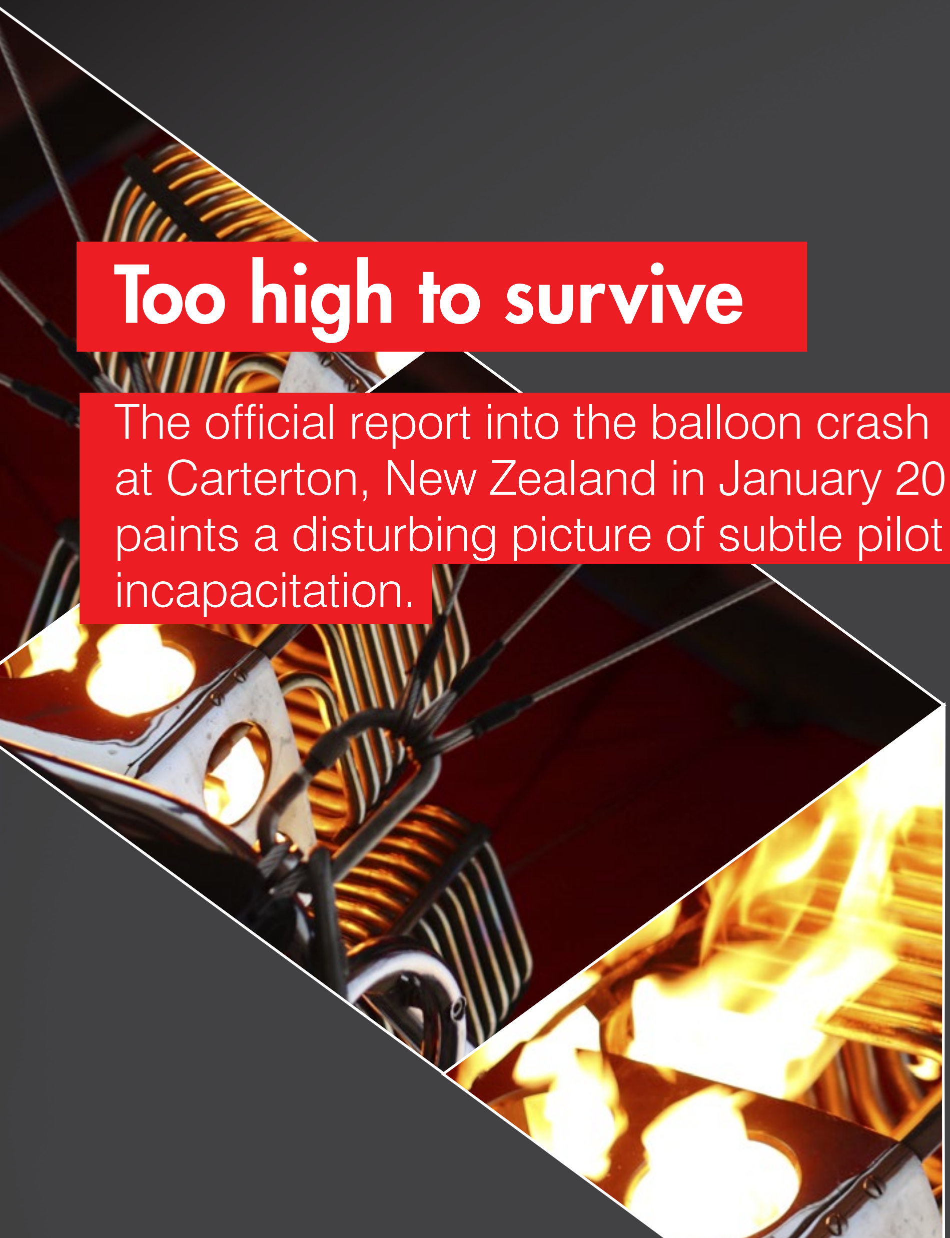
Crock and his company make a conscious effort to alert passengers to the surrounding environment. 'It's an occasion-based form of aviation. Most people only do it once in their lives', he says. 'The pilot will routinely show the infrastructure to the passengers before the flight. The basket will be pulled off the vehicle and while it is sitting on the ground, the pilot will invite the passengers into the basket,' he says. 'It's just ensuring that people are comfortable in the environment that they are in.'

But while Crock is confident in his company's safety briefings and procedures, he is also cautious and admits that danger begins when operators become complacent. 'I have every confidence that those are being adhered to and no shortcuts are taking place,' he says.

Ground level cold-inflation fans can operate at in excess of 1,400rpm and are arguably the most dangerous risk to passengers pre-flight. Even crewmembers are not immune to becoming snared in the blades of the fan. A serious accident in the US state of Louisiana, demonstrates the force with which these machines operate. As detailed by a National Transport Safety Bureau (NTSB) report into the accident:

According to the pilot, the crewmember stationed at the left side of the balloon, near the inflation fan, was holding onto the handling ropes during the cold inflation. As the pilot prepared to ignite the burner and continue the inflation process, she heard "a loud noise" and the crewmember fell toward her. The pilot saw that the handling rope was "wrapped around" the crewmember's thumb, which was "bound against the fan cage." The rope was cut to free the crewmember and he was transported to a hospital where his glove was removed and it was discovered that his left thumb had been severed.

In the wake of the recent fatality, all commercial operators are reminded of the ongoing risk to passengers not just in the air, but also on the ground. Industrial fans are not the first thing that spring to mind when analysing the dangers around ballooning. However, the very nature of these devices: large, bladed, highly powerful devices sucking in air from one end and expelling it the other, should evoke obvious concern and ensure adequate safety practices are adhered to. As the ATSB safety notice advises, all operators should revise risk controls and safety management systems surrounding the operation of cold-air inflation fans to ensure similar incidents do not occur.



Too high to survive

The official report into the balloon crash at Carterton, New Zealand in January 2012 paints a disturbing picture of subtle pilot incapacitation.

Like the stately progress of a furiously paddling swan, the serenity of a balloon in flight is an illusion. It may appear to float in the sky, but that is only because the great and deadly forces of gravity and fire are temporarily in balance. Add chemical impairment and the equation becomes unbalanced and dangerous. Add high-voltage electricity and the results are horrible.

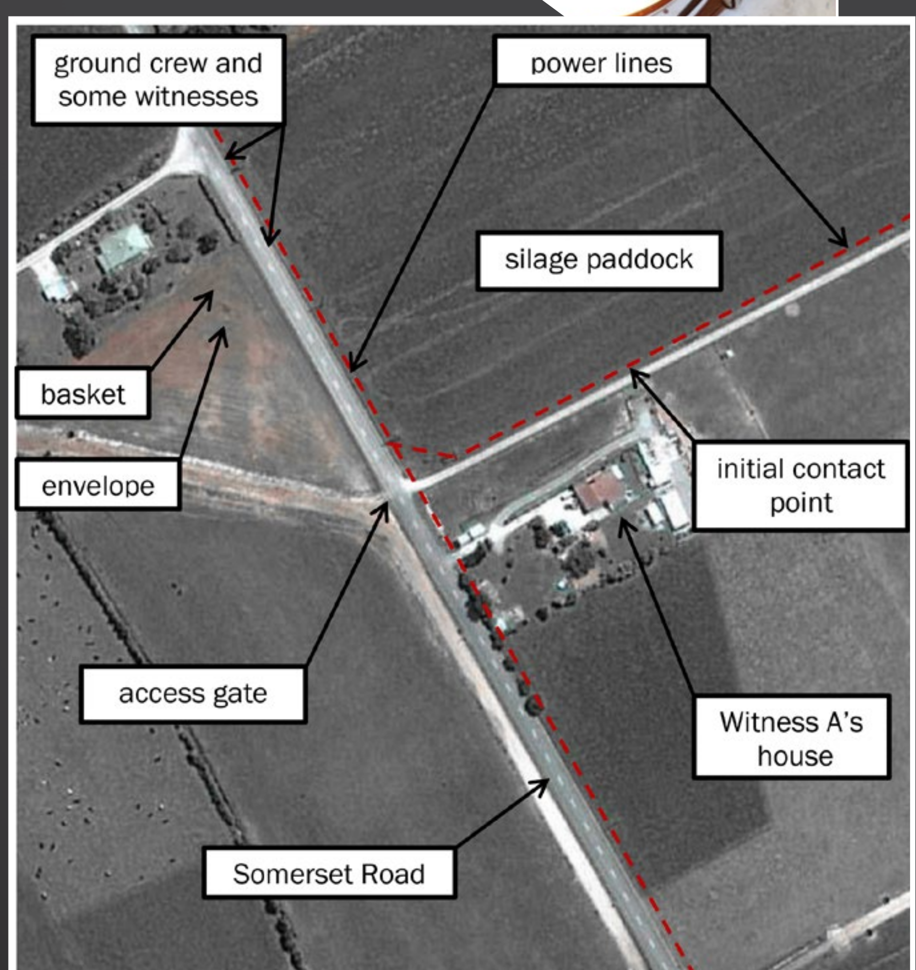
It seems unlikely that any of the ten passengers on the scenic flight near the New Zealand town of Carterton were thinking in these terms. And why should they? The company appeared to have a good safety record and in more than 100 years only four people had died in balloon accidents in New Zealand. There was beautiful scenery to see and a sumptuous breakfast to look forward to.

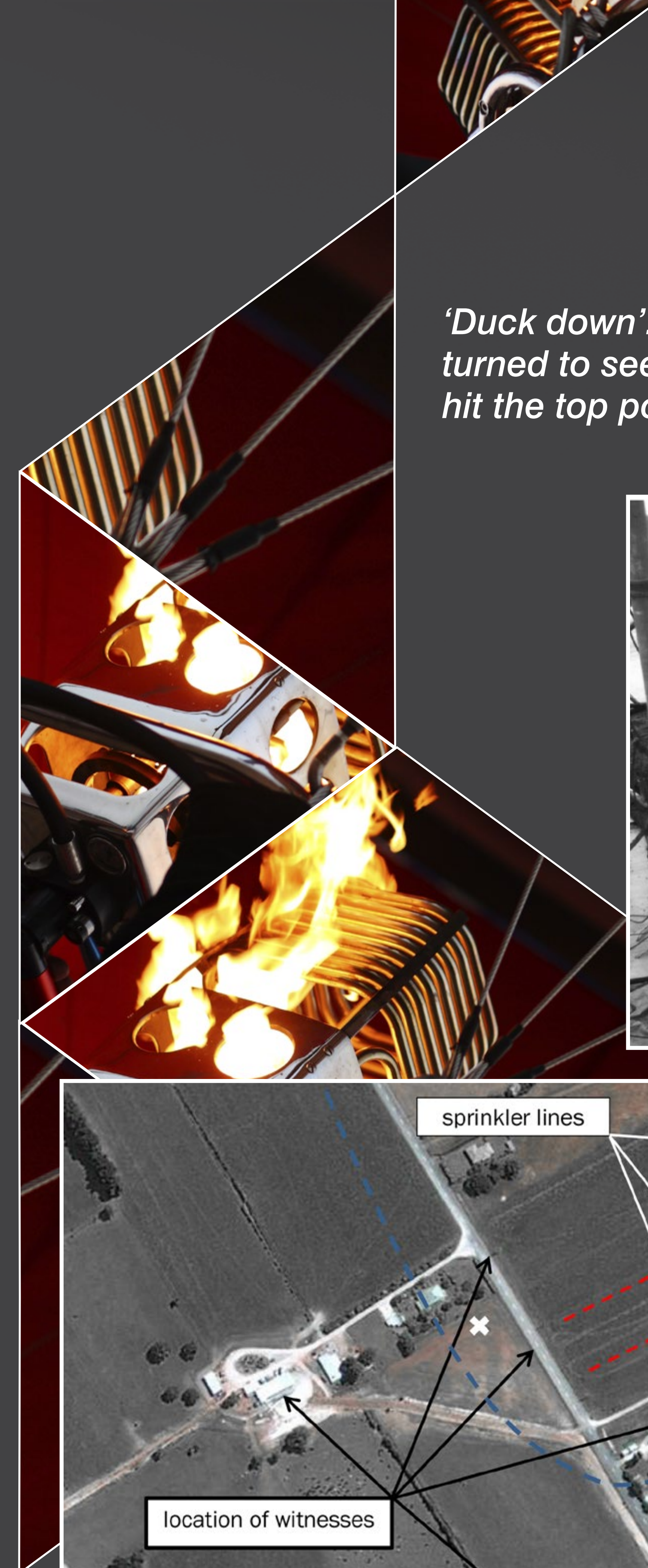
At 0639 local time the balloon with 11 people on board lifted off from near the edge of town, about 80 km north of Wellington. The weather was fine with a light and variable wind and the flight was uneventful for about 35 minutes, until the pilot began a descent in preparation for landing.

The balloon changed direction several times as it descended. About 0720, it was about 20 feet above ground level as it drifted over a paddock. The paddock was bounded on two sides by 33-kilovolt (kV) power lines with an average height of about 30 feet.

The balloon was drifting west towards the power lines on the western boundary of the paddock when the wind changed, taking it towards power lines closer to the southern boundary. The pilot applied the burners to climb the balloon over the power lines.

As the balloon's ground crew chief was walking to his vehicle, he heard the pilot yell out, 'Duck down'. The crew chief turned to see the balloon basket hit the top power line.





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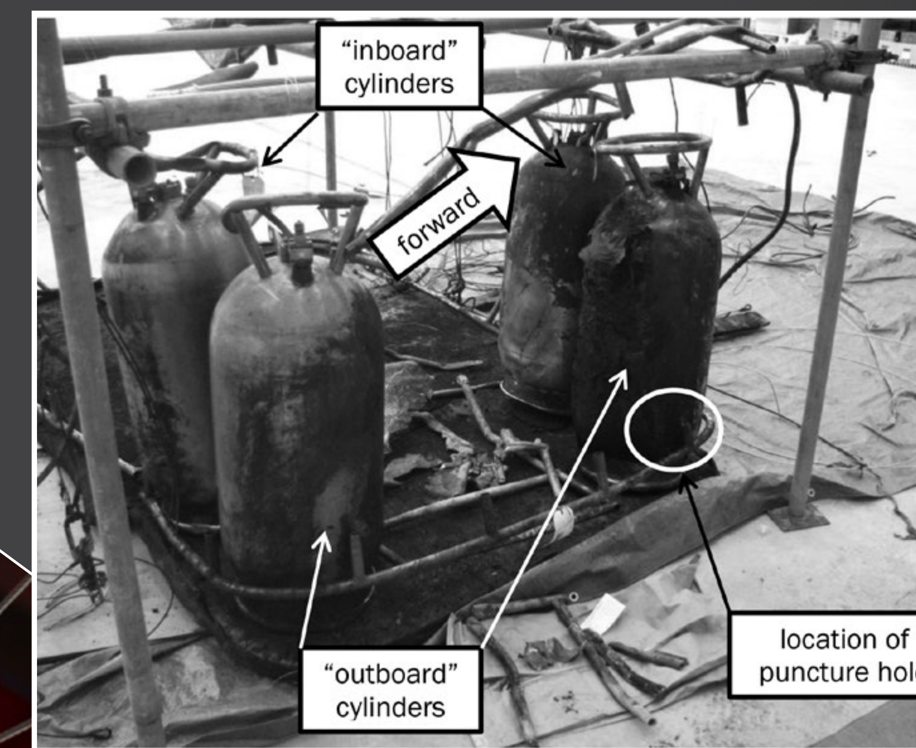
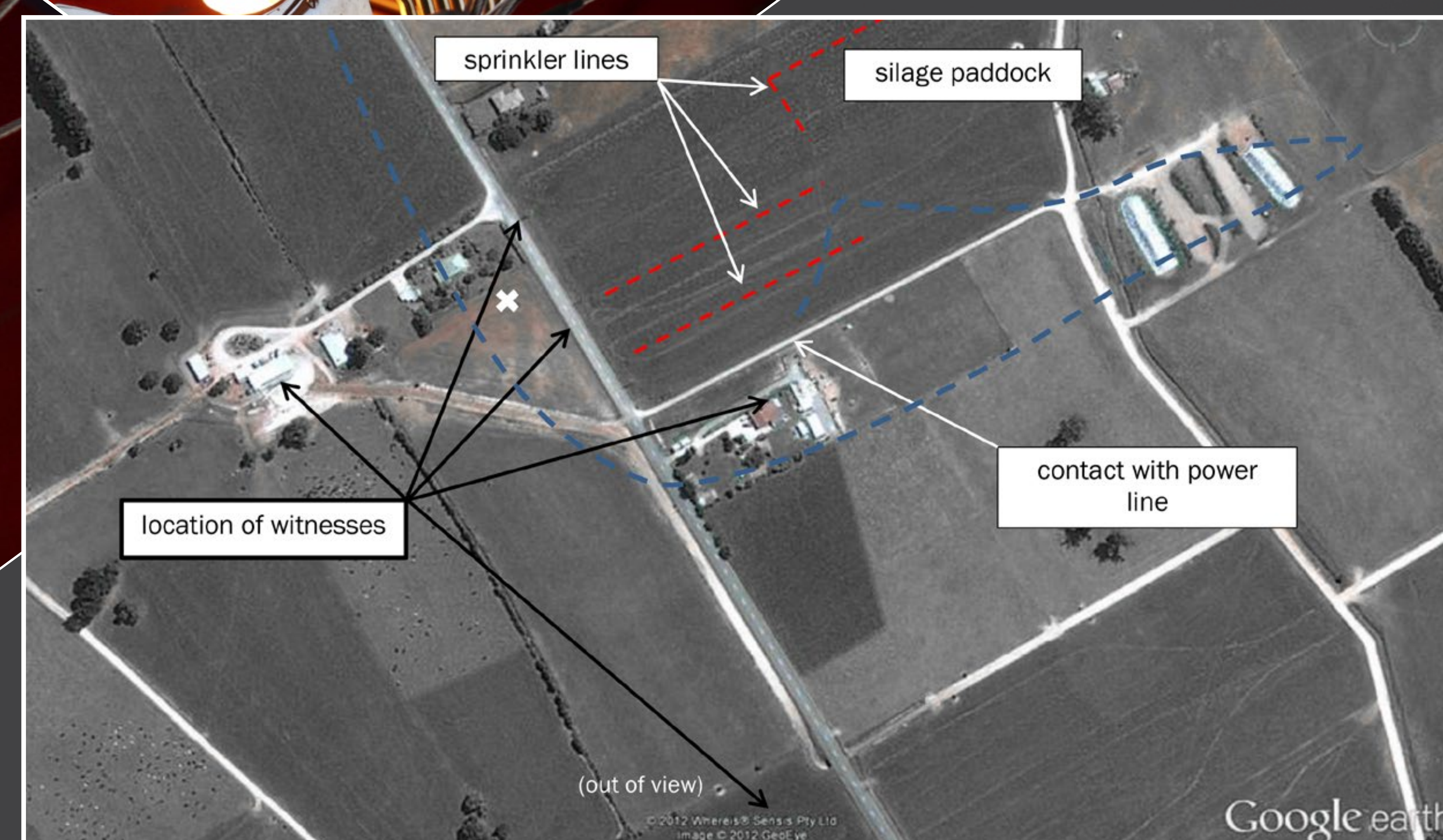




Photos: Transport Accident Commission final report – inquiry 12-001, 7 January 2012

A woman in a nearby house saw the balloon approaching the power lines and heard the burners roaring. She ran outside in time to see the basket caught under one of the wires, with people on board trying to push the top wire off the lip of the basket.

A professional photographer, contracted to the ballooning company, was already taking pictures, using a long lens from his car, because he feared he might miss the balloon's landing. These showed the balloon sliding along the wires, two of which were snagged on the basket.

Between 15 and 30 seconds later, according to the time stamp on the camera, there was an intense electrical arc and fire broke out in the lower part of the basket. One of the power lines then snapped. The official investigation concluded the arcing had ruptured one of the balloon's liquid petroleum gas (LPG) fuel cylinders, and fuel, escaping at about 100psi, intensified the fire.

The official report described arcing in these words: 'high-voltage electrical arcs comprise a cloud of ionised air plasma, with a temperature at the boundaries of approximately 5000 degrees Celsius, and internal arc temperatures reaching 20,000 degrees Celsius'. Further, the rapid increase in temperature causes 'an expansion of air and vaporisation, or melting, of solid material adjacent to, or surrounded by, the arc. The associated expansion in volume can spread molten metal over quite wide distances'.

Two passengers jumped out while the basket was still caught on the upper wire, which it was stretching upwards as the heat of the fire put it into a rapid climb. By now the balloon was at about 60 feet, which was too high for them to survive the fall. Soon after, the wires broke and the balloon climbed rapidly for about 40 seconds, to at least 400, and possibly 500 feet, before the envelope caught fire and collapsed. Everyone else on board died in the ground impact that followed. From the first arcing to the death of everyone on board took just over two minutes.

Investigation findings

The New Zealand Transport Accident Investigation Commission concluded in October 2013 that the pilot had not intended to land in the paddock bounded by the power lines, and that it had been an unsafe manoeuvre to allow the balloon to descend below the level of those power lines and remain at a low level as it crossed the paddock.

The Commission also concluded that when the balloon flew towards the power lines and collision was unavoidable, the pilot should have followed the balloon manufacturer's advice and rapidly descended his balloon instead of making it climb. 'Had he done so, the balloon occupants would have had a better chance of survival', the report said.

'It is highly likely that the pilot knew of, and saw, the power lines along the side and at the end of the silage paddock before allowing the balloon to descend below them', the report continued.

The Commission's report suggested a frightening possible contributing factor to why the pilot had, in benign conditions and with a reasonable time to react, flown the aircraft into a corner.

Post-mortem toxicology tests found two micrograms per litre of tetrahydrocannabinol (THC) in the pilot's blood. For those unfamiliar with the jargon of the counterculture, THC is an active ingredient of cannabis.

The Commission concluded the pilot had been using cannabis. How soon before the accident he had done so could not be conclusively proved, but two witnesses came forward to say they had seen the pilot smoking about 30 metres from the assembled passengers a few minutes after 0545. This was significant because the pilot 'with the exception of a cigar at Christmas, did not smoke tobacco'. Another post-mortem test found no trace in the pilot's urine of cotinine, a chemical associated with recent tobacco smoking.

If the pilot had been incapacitated by cannabis use, that incapacitation had been subtle. 'There was nothing reported to be untoward or unusual in the pilot's behaviour on the morning of the accident', it found. The photographer and ground crew said they noticed nothing strange in the pilot's behaviour and did not smell the distinctive odour of the drug about him.

But the Commission went on to quote an Australian Transport Safety Bureau (ATSB) study on cannabis use and piloting, which said:

'Flying skills deteriorate, and the number of minor and major errors committed by the pilot increase, while at the same time the pilot is often unaware of any performance problems.'

The Commission also heard of an 'aviation-related concern' reported to the Civil Aviation Authority of New Zealand in 2010. The caller said a balloon passenger had been told that their planned flight was cancelled because the pilot 'appeared too pissed and/or high'. The concern was about the pilot of the crashed balloon. CAA inspectors visited him, but he and a colleague were 'adamant that the incident never occurred'.

The CAA concluded: 'considering the level of accusations within the ballooning community against certain individuals it seems likely that this incident may not be genuine. No further action required'.

From the report: 'The Commission found that the pilot's use of cannabis could not be excluded as a factor contributing to his errors of judgement, and therefore to the accident.'

Another 'aviation-related concern' was about the balloon operator using an unauthorised method to test the strength of the balloon envelope.

Lessons to be learned

The report highlighted two key lessons:

'Both long-term and recent use of cannabis may significantly impair a person's performance of their duties, especially those involving complex tasks. Under no circumstances should operators of transport vehicles, or crewmembers and support crew with safety-critical roles, ever use it', it said.

Secondly it declared: 'Power lines are a well-recognised critical hazard to hot-air balloon operations. Balloon pilots should give them a wide margin and if they ever inadvertently encounter them, they should follow the balloon manufacturers' advice and industry best practice to mitigate the possible consequences.'

A question remains

An unanswered question was why nobody had ever confronted the pilot, reported after the crash to have been 'very safety conscious' and a 'top bloke', about his occasional cannabis use. Witnesses told the inquiry they were aware that the pilot regularly socialised with cannabis users, and one had seen the pilot use cannabis.

BLIND FAITH

It's the stuff of nightmares. At a critical moment during flight you turn to your electronic flight bag (EFB) needing information right then and there. Staring back at you is an uncooperative screen, telling you it's too hot, or has insufficient power to continue. Suddenly you're left scrabbling for that vital information—in ink rather than pixels—but by then, is it too late?

Do you even have a plan B?

Main photo: © Air France

Photo: © John Ewing

Tablets and iPads have become commonplace in cockpits at all levels of aviation, with their usability and affordability making them an attractive replacement for the cumbersome, weighty flight bag. From private to commercial operators, many are making the switch, but like anything new, it has given rise to fresh safety issues, some of which are only just coming to light. With the growing rate of EFB use comes an increasing number of pilots who are willing to depend not only on their iPad functioning flawlessly, but also on second-rate navigation software from unapproved vendors.

With advances in technology and the huge growth in online app stores, users now face an overwhelming choice of software products. At last count, on the highly regulated *Apple iTunes Store*, searching for 'aviation'/'navigation' applications returned over 170 results, with over 200 results on the Android equivalent, *Google Play* store. However, despite the wide range of tempting and often free choices available to pilots, only six vendors have been approved by CASA to provide the data required by the regs, such as the latest versions of the maps and navigational charts for the sector being flown.

Currently, all AOC holders are required to have a backup flight bag, whether it takes the form of hard copy charts, maps, documents or another EFB. However, this does not apply to individual operators, who are left to decide whether or not to carry a contingency. The growing prevalence of unapproved apps, along with a lack of backup for EFBs has industry professionals worried about pilots becoming over-reliant on a single, potentially unreliable device.

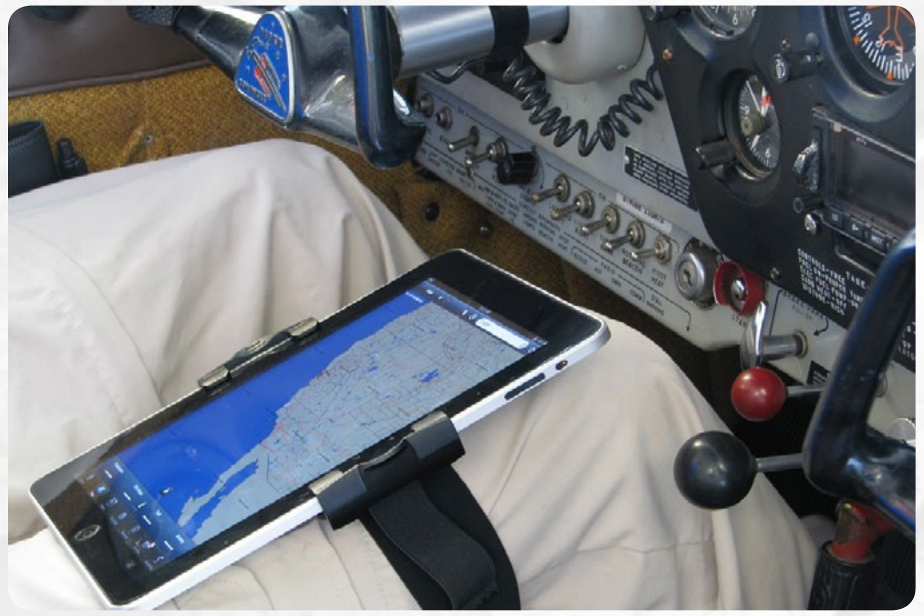
An Air Safety Group report published earlier this year, *The Electronic Flight Bag Friend or Foe?*, argues that EFBs can become dangerous when pilots overly rely on the technology, and should be treated with 'a healthy level of circumspection', even by the most experienced pilot. The report also asserts that software products such as those available on the *iTunes* and *Google Play* stores are 'prone to errors that can have sinister repercussions' and the blind faith being placed in them by pilots could prove to be fatal.

Furthermore, the report indicates the expansion of 'cheap' consumer goods across the industry, because of concerns about the cost of the traditional flight bag, could be problematic. Despite having undergone relevant testing, these devices are developed, manufactured and sold with the mass market in mind, not the challenging environment of avionics. Unsurprisingly, there have been reports of faulty tablet devices malfunctioning.

One incident in the US alerted the FAA to the risk of iPads overheating mid-flight. During a VFR trip and 'approximately two hours into the flight, the iPad displayed a notice indicating it had overheated, and shut down within about five seconds'. The pilot reverted to his paper charts and after a few minutes spent finding the correct position continued his flight. Despite the relatively seamless transition from pixel to print, the pilot admitted, 'had this happened during a complicated instrument approach, especially without paper charts being available, safety could have been impacted'.

The notion of a lithium-powered device overheating in a small cockpit is enough to ring alarm bells for anyone involved in aviation. Despite the iPad only having a 42.5 watt hour rating, less than half the 100wh rating allowed for carry-on items; at 10,500ft and operating under reduced air density, research has shown that the face of an Apple iPad 'acts thermally like a black surface, so considerable heat can be absorbed from direct sunlight'.

Despite being a professional electrical engineer, the pilot in America 'did not anticipate' the device overheating, particularly as the temperature in the cockpit was 'quite comfortable'.



Outside the world of aviation there have been countless consumer news stories of electronic devices failing and causing serious injury, like this one, where a man was electrocuted when he unplugged his daughter's charging iPad. Furthermore, warranty service *Square Trade* analysed over 50,000 iPads covered by its warranties and found that customers reported the iPad 2 had a total failure rate of 10.1 per cent, with 9.8 per cent of iPad 2s breaking in the first 12 months of use.

The mention of electric shock and lithium battery fire may seem alarmist. However, the potential for both is real, as is the possibility that, given the right circumstances, an EFB in the form of an iPad, regardless of rigorous testing, is just like any other mainstream electrical product and can fail without notice.

Despite this, a growing number of pilots are willing to depend entirely upon these mass-porduced consumer goods for survival in the air. While there is yet to be a major incident to snap them out of this naivety, how long before the holes in the Swiss cheese align and the blind faith being placed in these devices is revealed as folly? As the *Air Safety Group* report affirms, 'time after time, people are lured into a sense of security around computers that is dramatically shattered by some disaster'.

Principal engineer for avionics at CASA, Charles Lenarcic, stresses that pilots need to safeguard against the many safety concerns surrounding low-end EFBs. 'The single most dangerous thing about (the iPad) is that it can become a projectile', he says. In turbulent conditions, portable EFBs need to be attached to an engineered mount, approved and installed in accordance with CASR 21M, to safeguard against the risk of injury and EFB damage. CAO 20.16.3 is the legislation that deals with the stowage of objects in an aircraft and is applicable to all Australian-registered aircraft.

Lenarcic, who was part of the ICAO electronic flight bag working group, welcomes the EFB's ability to make the job of aviators easier. However he is weary of pilots, particularly of the VFR variety, who remain ignorant of the iPad's potential shortcomings. 'It is a commercial off-the-shelf product not built to any accuracy or reliability standard that we in the industry would recognise. It is not an aviation product', he says.

Despite this, Lenarcic estimates 'around 90 per cent' of VFR pilots fail to carry a backup. 'Pilots have to ask themselves; "In the event of a failure, what is my backup?"' he says. 'If you're in IMC and your iPad fails, and you have no maps, no charts, no frequency to call for help, what are you going to do? Hope that the iPad comes back? Especially in turbulence—if the device has hit the ceiling and smashed—you've got nothing.'

Lenarcic emphasises that responsibility falls on the pilot to have 'readily accessible' maps and charts from approved vendors. 'It is up to you', he says. 'If you believe your iPad is never going to break down; you're never going to drop it and break the screen; it's never going to get a flat battery; it's never going to fail; then don't carry anything else. But if you are on the ramp and a CASA inspector says "Show me your maps" and you have a flat battery, you are in breach of Civil Aviation Regulation 233(1)(h).'

EFBs are still relatively new in aviation but have rapidly shot to prominence because of their usefulness and ability to help cut costs. Despite this innovation, tried-and-tested safety measures remain. Having a contingency, a plan B, will not completely avoid the possibility of multiple failures and the holes in the Swiss cheese aligning, but it will add another layer of defence and help reduce the overall risk.

Revised CAAP 233-1(0): Electronic Flight Bags
October 2013

7.2 Screen size

7.2.1 The screen size and resolution will need to demonstrate the ability to display information in a manner comparable to the paper aeronautical charts and data it is intended to replace. The recommended minimum size of the screen is 200mm measured diagonally across the active viewing area. If the intent of the installation is to display charts and maps, the device should be suitably sized to display the image without excessive scrolling.

Note: Some manufacturers' screen sizes may vary marginally from this minimum but may still be acceptable

Safety in numbers

Classic aircraft require skills to maintain and fly, then be preserved for posterity

You see them parading down the freeway in all their chrome-plated glory. Well-loved classic cars on a club run. Less visible, but even more important for owners of classic general aviation aircraft—and that's most Cessnas, Pipers or Beechs—are the similar organisations in the aviation community. Like their automotive counterparts, they do a great deal more than organise picnics and concours d'elegance. Type clubs foster a healthy culture and information exchange that directly relate to aviation safety.

Whether for Beechcraft Barons and Bonanzas, Mooneys of various types, or antique machines, these aircraft communities serve an ever-increasing role in the life of these aeroplanes. As forums, bringing together people and information, they have benefited greatly from the growth of the internet. Modern type clubs facilitate an exchange of ideas across the globe. As Ron Koyich of the Australian Bonanza Society says, the organisation's affiliation with its American counterpart allows access to a vastly greater number of aircraft and owners and the resultant knowledge base.

When the type had a control cable issue that resulted in an airworthiness directive being issued, owners around the world were exchanging their thoughts and cable inspection photographs over the internet in the blink of an eye. A tremendous amount of information was shared, providing benefits that an owner could not hope to achieve in isolation.

Healthy discussions in support of airworthiness directives and sharing techniques and first-hand accounts are just a few of the ways in which the clubs' 'grapevines' enhance the operation of the particular aircraft type. Many clubs also actively promote safety programs for both maintenance and piloting. Conducted as seminars and online, the courses can delve more deeply than general training. The idiosyncrasies of the specific type can be addressed with the benefit of a deep pool of experienced owners and operators. The Australian Mooney Pilots Association conducts such courses and also seeks to identify instructors who have solid experience of teaching in Mooney or other high-performance aircraft. The goal is to develop a cadre of knowledgeable instructors who will teach the factory-recommended method of flying the aircraft.

Casting the net further back in time, the Antique Aeroplane Association of Australia (AAAA) encompasses a broad range of aircraft from a bygone era. In some cases there are specific type clubs, while other aircraft may not have the numbers to form their own club.

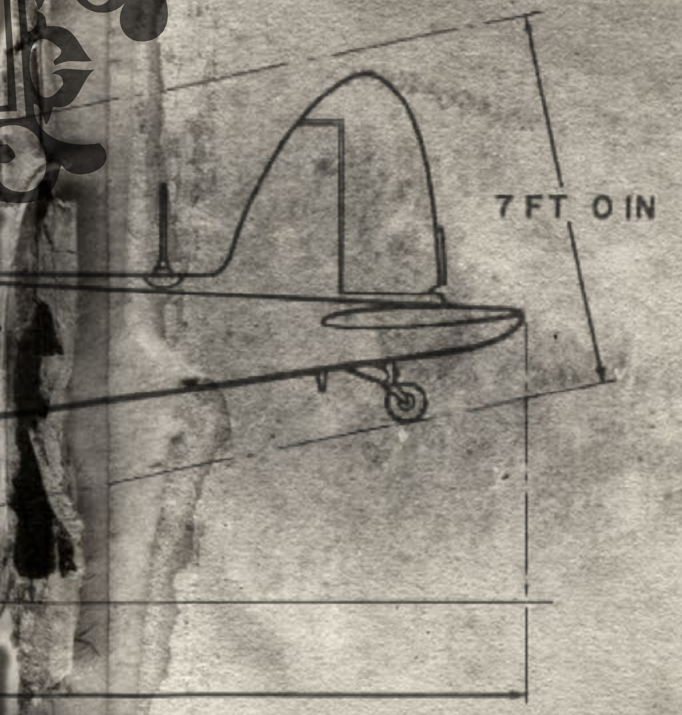
The goal is to develop a cadre of knowledgeable instructors who will teach the factory-recommended method of flying the aircraft.

... the clubs can provide the latest information 'hot off the press',or recommend an engineer with experience on that aircraft type.

Dick Gower has been involved with antique aircraft for many years, in both engineering and flight instruction roles. He is an ardent fan of a classic post-war military trainer, the deHavilland Chipmunk. The 'Chippy' does not currently have an Australian-based club although Gower would dearly like to see one formed. However, Chipmunk fly-ins and the global reach of the British-based type responsibility agreement holder, DH Support, mean that the type can still benefit from a form of community.

Gower also sees a role for clubs and communities in ensuring the continued safe operation of ageing aircraft types. With their detailed knowledge of a particular aeroplane, clubs are well placed to create specific maintenance schedules. Often, the original maintenance plan was devised decades earlier, when the continued operation of the type into the 21st century could not have been foreseen. A significant number of older aircraft were also originally maintained under military programs that had little or nothing to say about their current life stage and duties.

The number of LAMEs with the skills to maintain these classic aircraft is sadly dwindling. A tailored maintenance schedule enables them to formally document all that has been learned over the years and preserve the information for maintainers and pilots of the future. In this way communication between operators can span not merely distance, but time. An engineer at the UK's Imperial War Museum, Duxford Airfield, once reflected that there would always be people with sufficient funds to keep historic aircraft flying, but a failure to preserve the knowledge and skills of maintenance could be what grounded them.



Facebook, fly-ins and online forums are just a few of the ways in which the organisations communicate. While there is undoubtedly an enjoyable social aspect to these interactions, the ability to source parts or recommend an experienced maintenance organisation cannot be overlooked. In turn, the various clubs communicate with each other and exchange ideas and philosophies. That open dialogue also extends to CASA.

Pieter van Dijk is the project manager for CASA's ageing aircraft management plan (AAMP) and sees the role of aircraft clubs as 'very important'. He recognises that interaction with such organisations is important as the members are generally enthusiasts with a passion for their aircraft. In many cases these are low-time pampered showpieces, in comparison to some of the ageing workhorses that are enduring the hard life of hauling night freight.

Rather than the clubs being a particular focus of concern in the realm of ageing aircraft, van Dijk sees them as a valuable asset and a source of worthwhile information. They are the people who can highlight particular operational and maintenance aspects to prospective owners before they purchase. Then, once they've bought the aircraft, the clubs can provide the latest information 'hot off the press', or recommend an engineer with experience on that aircraft type.

Van Dijk echoes Gower's thoughts on tailored maintenance for aircraft types. The establishment of an approved management program could target the specific requirements of a particular species. Many US types use a standard maintenance schedule designed to encompass all seasons and locations, from Alaskan winters to Arizona summers. Van Dijk foresees that in conjunction with the manufacturer, maintenance schedules could be designed to reflect the Australian operating environment. In this case, consultation with type clubs could refine the maintenance programs by drawing upon their wealth of knowledge.

On the surface, aircraft clubs may appear to be merely a wonderful opportunity for like-minded folk to socialise and swap stories. Not that there's anything wrong with that! But there's much more, such as the ability to efficiently disseminate critical operational information and provide ongoing training and education. As aircraft types, owners and maintainers increase in age, there is also the ability to share knowledge and be a part of the process that sees the aircraft fly well into the future, perhaps under a tailored maintenance program.

They say that birds of a feather flock together—for many aircraft owners and operators this takes place within the community of aircraft type clubs. However, more to the point, through open and proactive information sharing, these communities have the ability to demonstrate that there truly is safety in numbers.

... through open and proactive information sharing, these communities have the ability to demonstrate that there truly is safety in numbers.

Regional airports and the business of safety

'The main purpose of the ILS is training ... But it also provides a clear safety benefit, and it's available to any IFR-capable aircraft that uses the airport.'

Call it the Field of Dreams principle. "Build it and they will come,'' as the frequently misquoted line from the 1989 film about a ghostly baseball team goes.

The film was a fantasy, (and the actual words were: 'If you build it, he will come'.) but airport operators in regional Australia are finding this tag line sums up the relationship between investment, aviation prosperity, and, ultimately, aviation safety.

The link is subtle, but simple. Airports that attract traffic and other sources of revenue can also attract facilities, whether for air navigation, pilot training or aircraft maintenance. A critical mass can develop.

Stephen Prowse, as Wagga Wagga City Council's Manager Commercial Businesses, and the NSW Chairperson of the Australian Airports Association, is a firm believer in the nexus between prosperity and safety. This can be as simple and as brutal as the example of a cross country private flight pressing on with low fuel because a refueller at an out-of-the way aerodrome has closed, or charges higher prices to make up for reduced volume. People often forget that the converse is also true. 'Prosperity and safety are linked in terms of access to quality facilities and safety systems.'

Prowse acknowledges that many smaller rural and regional aerodromes in Australia are on the back side of this curve. 'Unfortunately across the country a large number of regional airports are operating at a significant loss. Their infrastructure, and in particular pavements, are ageing, and in many cases were designed for much smaller and lighter aircraft than are currently operating there. '

But in his other role is as Manager of Wagga Wagga Regional Airport, in southern NSW, he has seen how economics can serve safety when attitudes change. The converse is also true, as well maintained aerodrome facilities can place an airport in good stead to capitalise on commercial opportunities as and when they arise, he says. Several themes emerged in discussions with *Fight Safety Australia.*

Shift your perspective

Prowse says in about 2007 Wagga Wagga City Council started to undergo a paradigm shift in its view of the airport. 'Previously the airport was located in Council's infrastructure directorate. It was considered similar to any other community asset - something that had to be maintained, albeit in a highly regulated environment,' he says.

'In 2006/07 the airport was moved into the corporate services directorate before finally being relocated to the commercial and eonomic development directorate. That's where a real mindset change occurred - from the airport's prime function being mainly about passenger facilitation, to being also about regional economic development and employment growth – of which passenger facilitation is clearly a very important part.'

In the course of developing a more economically competitive airport, Wagga Wagga City Council also ended up building a safer airport, Prowse says, citing the example of a number of aircraft pavement strengthening and resurfacing projects, to the installation of an instrument landing system (ILS) that was jointly funded with Council, Airservices Australia and Regional Express Airlines. 'We were also fortunate enough to receive a Federal Government grant of just over $1 million towards the project. The main purpose of the ILS is training, for the Rex-owned Australian Airline Pilot Academy (AAPA), and as a training aid for Airservices Australia trainees from NSW TAFE Riverina Campus. But it also provides a clear safety benefit, and it's available to any IFR-capable aircraft that uses the airport,' Prowse said.

'Every airport has some untapped potential,' Prowse says.

In northern NSW the town of Glen Innes (population 5000) is addressing the problem of keeping its airport viable by attracting an international flying school. Australia Asia Flight Training is planned to begin operations at the airfield this year. The company is taking up a 30-year lease on the airport and will be responsible for the upkeep, maintenance, licensing, and running of the airport, Council's Director of Development, Regulatory and Sustainability Services, Graham Price told ABC news. The purpose-built college is expected to ultimately house 600 students. There are also plans to build an ILS at the airstrip.

Use your advantages

Regional Express Airlines, known as Rex, is based in Wagga Wagga, where it was formed through a merger of Kendell Airlines and the Orange, NSW-based Hazelton Airlines, both of which failed due to the Ansett collapse of 2001.

In 2010 Rex moved its in-house ab-initio flying school, the Australian Airline Pilot Academy to Wagga from Mangalore, Victoria. AAPA chairman, Dale Hall, says the advantages that made the area the centre of one of the biggest pilot training operations in history, the Empire Air Training Scheme of World War II – were still in place.

'It has flat but not featureless terrain, benign weather but still with enough variety to offer a challenge, uncrowded uncontrolled airspace, and a network of aerodromes,' Hall says. 'The training area is one of the biggest in the country. You can fly at up to 10,000 feet, do navs and do them relatively safely. Even if you do have an emergency there are thousands of square kilometres of paddock to land in.'

Prowse says any aerodrome in Australia will have some combination of environmental, natural and cultural factors that offer a unique competitive advantage. An aerodrome on the east coast could be a candidate for whale watching flights for example, a regional airport with large jet facilities serving an agricultural area could exploit the Asian demand for fresh air-freighted produce.

Several state government schemes fund regional airport development. Victoria has a $20 million regional Aviation Fund, and Western Australia operates a Regional Airports Development Scheme. Queensland ceased its Regional Airports Development Scheme in 2013, but its Department of Transport still considers funding requests. The Federal Government offers funds to regional airports under the Regional Development Australia Fund. Parkes Regional Airport, in central-western NSW, obtained $1.5 million from this source, for redevelopment. Canberra also manages the Regional Aviation Access Programme (RAAP), which consists of five distinct initiatives and funds. The NSW Government Department of Trade and Investment funds airport works, and contributed to the upgrade at Glen Innes.

Work with lean models

Regional aviation has changed greatly in recent years. Like the fast-growing international carriers it has adopted many elements of the low cost, high turnaround model of air transport. Airlines such as Rex use low-cost model elements such as single type operations, point-to-point scheduling and airport cost control.

This is because Rex faces a simple tough calculation, Hall says. 'The more we charge the fewer passengers we will carry. We're competing against the car and the bus out here.'

His wish is for airport operators to perceive the incoming passengers as a source of spending, rather than tax revenue.

'We build economic models where we show operators that the airport can generate revenue in the community. But it depends on them reducing their head tax so we can reduce our ticket price.'

We've walked away from some operations. The airport operator misses out then and so does aviation.'

Embrace the changes

'It's cheaper to have massive flying schools here in Wagga Wagga than in Bankstown, Perth, or other places like that, mainly because of land prices,' says Hall. Like Prowse, he agrees with the suggestion that a subtle change is occurring in Australian aviation: More and more facilities are migrating from large general aviation aerodromes on the fringes of coastal cities to regional airports.

Hall says for some operations, regional airports are emerging as direct rivals for secondary metropolitan airports. 'We would be happy to consider basing aircraft at regional airports because these days the best regional airports rival metropolitan GA airports for facilities and have advantages when it comes to issues, such as curfews.'

Wagga Wagga City Council attracted aircraft refurbisher Douglas Aerospace to the airport, following development flowing from the council's airport master plan 2010. The aircraft painting specialist relocated from several locations to consolidate at Wagga. Douglas has built a hangar capable of accommodating Boeing 737- 800, and is building a second hangar for work on smaller regional aircraft, as part of the Wagga Airport's newly completed Commercial Aviation precinct.

Strong regional centres with the necessary critical mass will find opportunities in aviation,' says Prowse. 'Airports need to be proactive, and be poised to react to opportunities as they arise. Maintenance and repair organisations (MROs) generally are not particularly well provided for in Australia. There are many significant opportunities in this space, particularly in an inland region with favourable weather, good infrastructure and comparatively low charges which provide the airport, and operators with a competitive cost andvantage to capital city-based operations. Australia has challenges in being cost competitive due to higher labour rates, so keeping overheads down is critical. For those aircraft operators who have maintenance done overseas, particularly up to narrow body jet size, there are real advantages to having aircraft maintenance done domestically. However, and rightly so, these customers demand high quality facilities and work. The safety improvements to facilitate these operations then flow onto all users.'

The economic pressures associated with taking a commercial aircraft out of service can also create opportunities, Prowse says.

Thinking from the perspective of a customer: if you've got an aircraft—a revenue generating asset—that's out of service because it's on the ground being painted, then it makes pure economic sense to have other work done at that time. It could be avionics, internal refurbishment, or other engineering work. Aircraft earn money when they're flying, therefore to minimise downtime, and maximise maintenance done at a 'one-stop-shop' adds to the bottom line. That's where we see the greatest opportunity for our commercial aviation business cluster.'

'We build economic models where we show operators that the airport can generate revenue in the community ...'

The spillover effects of more maintenance repair capability in regional Australia apply to any aircraft within reasonable flying distance from there, 'from an RA-Aus registered aircraft right up to an air transport aircraft,' he says.

Play safe if you want to do business

On the topic of capital raising Prowse has a distinctive insight. 'SMS must become part of your culture,' he says. 'If you don't have a safety case you probably don't have a business case: and without a business case you won't be in a postion to raise the necessary capital to develop your airport.'

2013 AOC Holders Safety Questionnaire

Each year, CASA performs the AOC Holders Safety Questionnaire (AHSQ) which collects detailed information from air operators certificate (AOC) holders about their activities, types of aircraft, hours flown and other factors impacting on safety.

CASA uses the information received in the AHSQ for a wide variety of purposes, including:

- identifying emerging safety risks,
- measuring activity levels within the industry to assist with resource allocation, and
- gathering information to assist with improving regulation.

Questionnaire results

The 2013 survey provided an image of the composition and size of the 856 AOC holders and their operations.

Regular public transport (RPT) operators reported carrying just under 70 million passengers in 2012. Over 3.3 million passengers were carried in transport charter operations, while around 461,000 passengers were carried in scenic charter operations. Compared to the previous year, passenger numbers in RPT, transport charter and scenic charter increased.

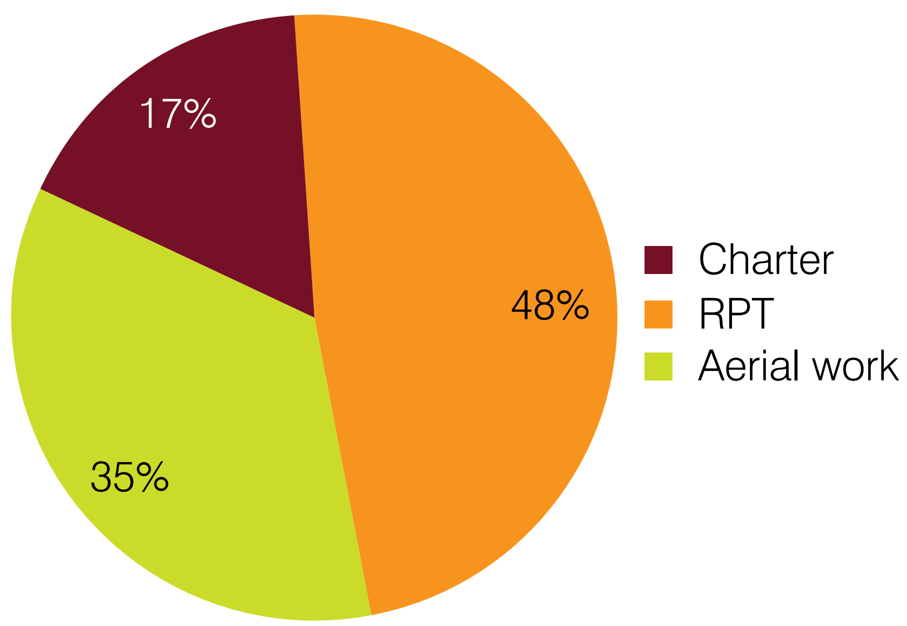
Selected passenger characteristics, all sectors

Industry Sector	Passenger Numbers 2011	Passenger Numbers 2012
RPT*	64,017,188	69,896,154
Transport Charter	2,600,050	3,307,115
Scenic Charter	378,538	461,851
Balloon	92,643	60,535
Other	89,881	41,770

* These figures include domestic & international Australian airlines and figures may differ to BITRE due to different counting rules

There RPT sector accounted for nearly half of the flying hours conducted across all industry sectors in 2012. This was followed by aerial work and charter. All three sectors reported an increase in flying activity compared to the 2011 calendar year.

Hours flown by sector



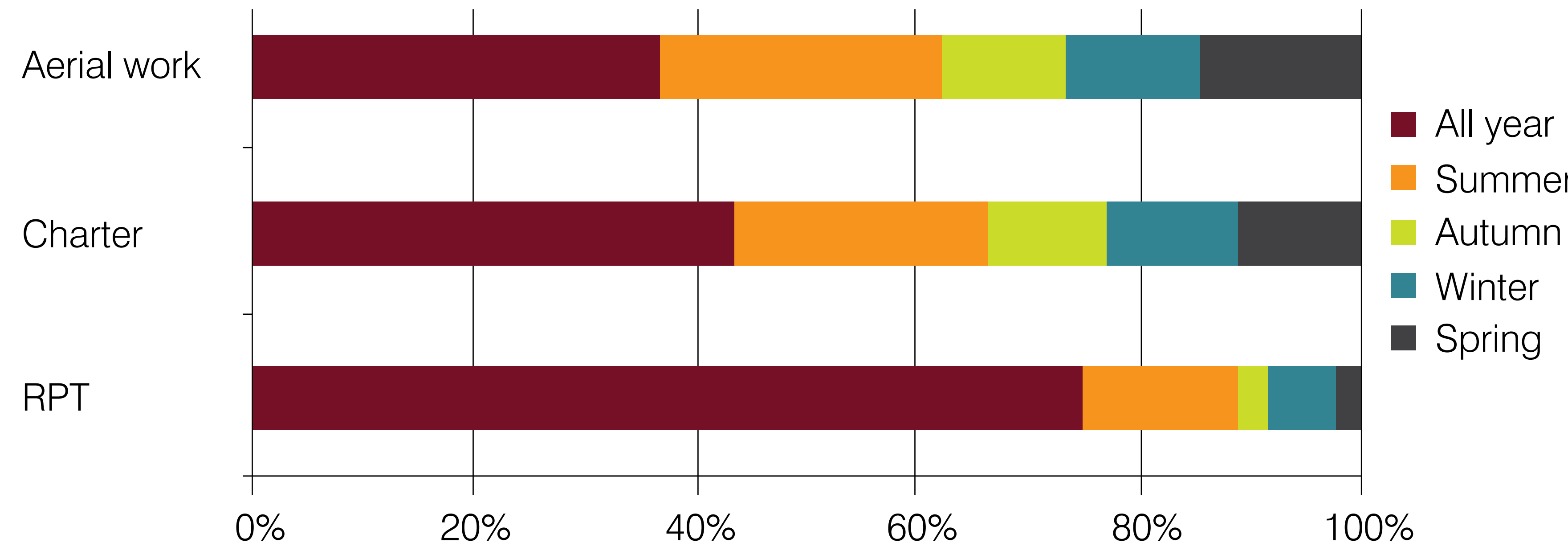
Peak season

Three-quarters of RPT operators reported having no peak season with constant operations year round. Summer was the peak season for five operators (14%), with winter being the peak season for two (6%).

Charter operators reported a different pattern, although constant operations year round was still the highest category, with just under half (44%) of operators. Summer (22%) accounted for the next most common season.

Aerial work followed a similar pattern to charter operators with some slight differences. Over one-third (37%) reported year-round operations, followed by summer (26%), spring (15%), winter (12%) and autumn (11%).

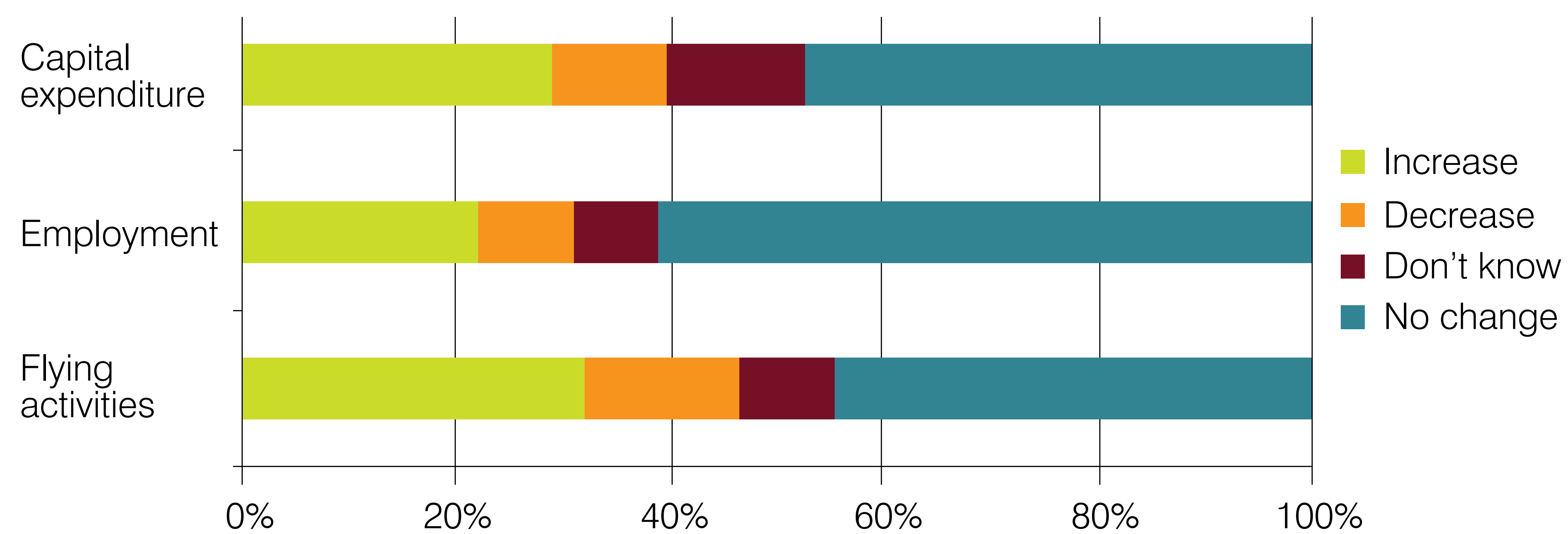
Peak season for RPT, charter, and aerial work



Expectations

Operators reported having a stable or optimistic attitude towards capital expenditure, employment and flying activities in 2013. The majority of AOC holders indicated that they expected no change to their employment level. From the three categories, flying activities contained the most operators expecting an increase in activity. This is consistent with the increase in passenger numbers and hours flown reported over the past two years.

Organisational expectations for the 2013 calendar year



Employment information

In 2012, AOC holders directly employed around 56,000 people, with the largest categories being cabin crew, other employees (such as non-technical and administrative staff members) and pilots.

Number of employees by type

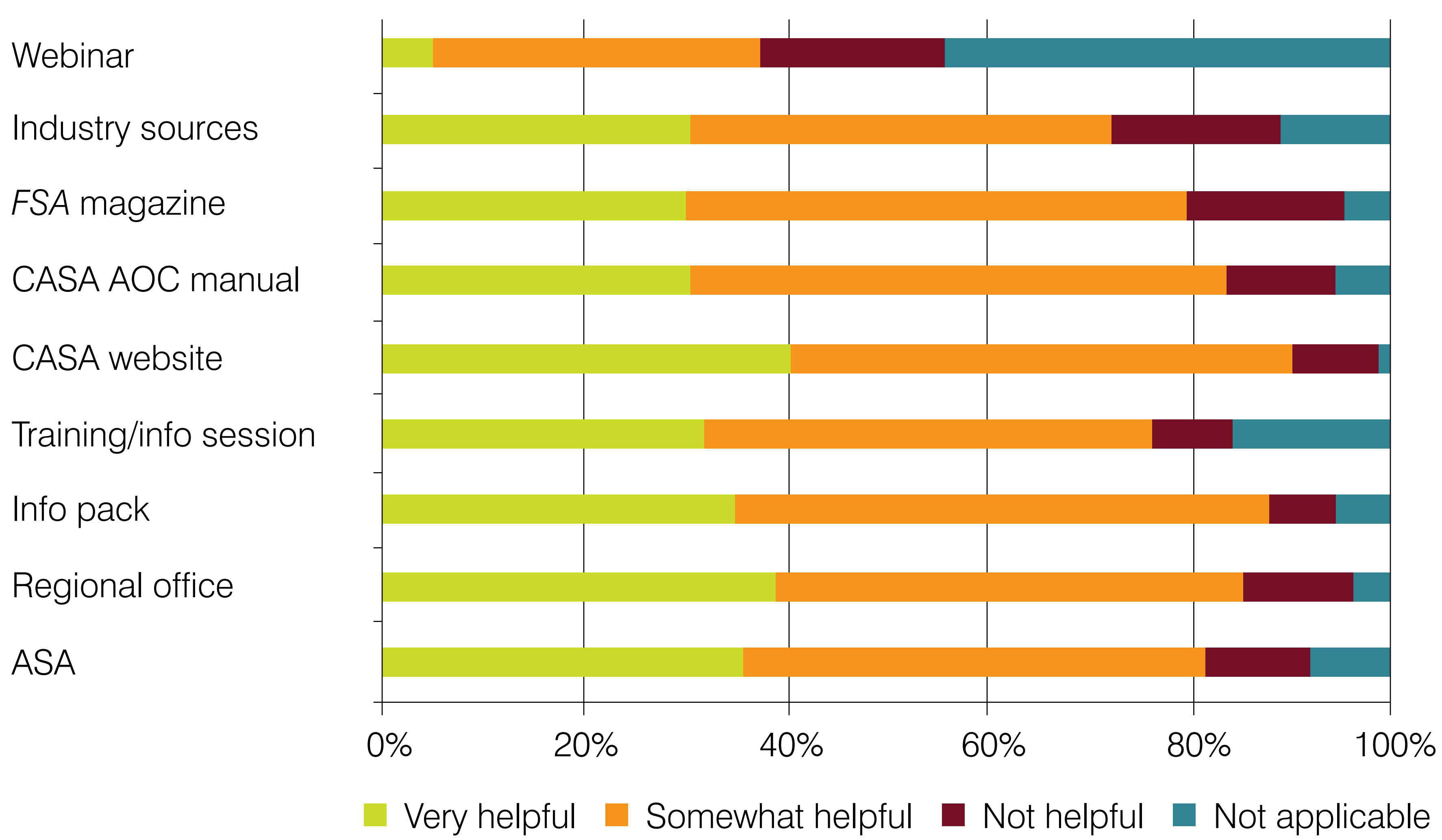
Type	Casual	Permanent	Temporary/ Fixed-term contract	Count
Cabin Crew	790	11,452	918	13,160
Other employees (Non-tech & admin)	417	12,287	398	13,102
Pilots	983	9,527	447	10,957
Ground Operations	465	8,766	1,710	10,941
Engineering/Maintenance	158	7,129	530	7,817
Total	**2,813**	**49,161**	**4,003**	**55,977**

This employment figure does not include non-AOC sectors of the industry such as air traffic control

Information helpfulness

The CASA website was rated as the most useful place to get information with around 40 per cent rating it as very helpful and a further 50 per cent rating it as somewhat helpful. Only 9 per cent rated the website as not helpful.

Helpfulness of information from various sources

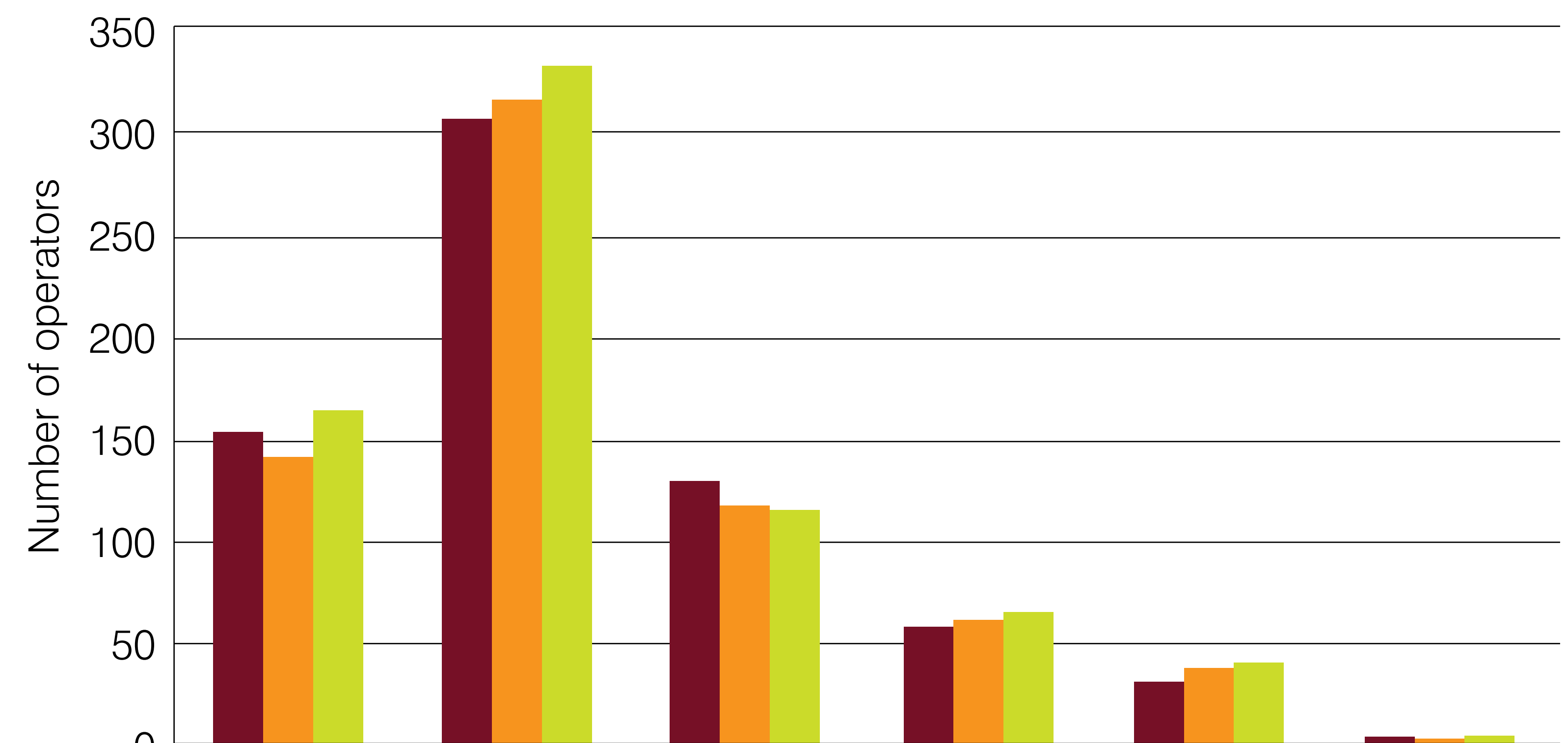


Aircraft operated

AOC holders reported that they operated 4,376 aircraft during the 2012 calendar year, which accounts for around one-third of the more than 15,000 aircraft on the Australian register. This is consistent with previous surveys. Operators also reported using 46 foreign registered aircraft (1.1% of the total used) during 2012.

The majority of AOC holders operate with two to five aircraft. There is also a large portion of operators using a single aircraft. However, the majority of flying hours come from the operators who manage more than 50 aircraft.

Annual AHSQ comparison of aircraft used by AOC holders



	1	2 to 5	6 to 10	11 to 19	20 to 50	>50
2012	155	306	130	58	32	5
2011	143	316	117	62	39	4
2010	164	332	115	66	41	5

The majority of AOC holders are smaller organisations, and this is reflected in the types of aircraft being flown. The most commonly reported aircraft in the 2013 AHSQ were the Cessna (C172), Robinson helicopters (R22 & R44), Piper (P28A) and Bell helicopter (206).

Top five most commonly reported aircraft type

No.	ICAO designator	2013 AHSQ aircraft
1	C172	315
2	R22	242
3	R44	221
4	P28A	175
5	B06	163

Next survey

The 2014 AOC Holders Safety Questionnaire will be distributed to industry in the first quarter of 2014. CASA values all input received from industry and we would like to thank all AOC holders for their efforts in providing responses.

TOWERS, TENDERS AND RADAR

One day the mining boom in outback Australia will come to an end. Happily, it will leave behind infrastructure to make aviation safer.

'Airservices has made a major commitment to investment in new equipment, training and recruitment to ensure we can deliver outstanding services to this community and others where airports are experiencing significant and sustained growth'.

A key fact for aviation planning is that a woman's haircut and rinse costs $160 in the Pilbara region of Western Australia. The hefty price is because the stylists, like most other workers in the region, fly in and fly out once a fortnight. Almost everything, and almost everyone, in this part of the word relies on aviation.

This is the downside of a fly-in fly-out (FIFO) employment model. Towns built from scratch by mining companies—such as Leigh Creek South in South Australia, and Newman in WA, with all the normal, everyday-priced amenities and facilities—are a thing of the past, unjustifiable in terms of overall cost.

Besides bulky pay packets in the pockets of mining personnel, there are however many positives about FIFO, not the least of which is a vast improvement in facilities at regional airports to service hugely increased air traffic. Outback skies aren't quite the isolated areas they used to be.

Things began to ramp up back in 2009, when Airservices reintroduced an operational aviation rescue and fire fighting (ARFF) service at Karratha, then the busiest regional airport in WA. Monitoring all regularly scheduled passenger aircraft arrivals and departures seven days a week, the on-duty fire crew staffs a Fire Control Centre and three Rosenbauer

Photos: Airservices Australia

MK 8 ULFVs (ultra-large fire vehicles); Austrian-assembled state-of-the-art tenders over 10 metres long, weighing in at 30 tonnes, but still capable of a top speed of 120km/h thanks to a 14.0 litre Detroit Diesel engine pushing out 495kW of power and 2576Nm of torque, allowing response to incidents within two minutes.

Fully equipped with fire-fighting agent, these behemoths can empty their 9000-litre water and foam-filled tanks in less than two minutes via a roof-mounted monitor capable of throwing the contents a distance of more than 80 metres.

As ARFF General Manager Andrew Rushbrook said at the time: ‘Airservices has made a major commitment to investment in new equipment, training and recruitment to ensure we can deliver outstanding services to this community and others where airports are experiencing significant and sustained growth’.

Providing regular domestic services, connections to overseas destinations, and as an equally important base for extensive mining and tourism operations in WA, Broome airport also received a significant upgrade with the opening of a new $20 million combined air traffic control tower and aviation rescue fire station, some 18 months ago.

Standing over 16 metres high, the air traffic control tower is kitted out with the latest air traffic surveillance and communications technology including touch screens at the controller’s consoles— no more paper flight progress strips! With eight huge windows of 40mm thick glass, each weighing 600kg, the new tower is the first that Airservices has opened in 15 years (though a further $942 million will be invested all over Australia in similar infrastructure over the next five years), and features two vehicle bays and a maintenance bay, home to another three mighty Rosenbauer Mk 8s.

Taking 14 months to design, and built by local contractors supported by specialists from Sydney, Melbourne, Brisbane and Perth, the facility is steel-framed, covered by Colorbond steel and compressed fibre-cement sheeting, and is designed to withstand Category 4 cyclones. It also collects rainwater for landscape irrigation.

There is also a new Airservices radar installation at Paraburdoo, in the Pilbara. It provides air traffic controllers with the ability to ‘see’ aircraft down to the ground at Paraburdoo, as well as giving coverage down to approximately 10,000 feet for aircraft operating out of the West Angelas iron ore mine 110km NW of Newman in the Hamersley Range; Barimunya, the airport for BHP-Billiton’s Yandi iron ore operation 90km NW of Newman, and Fortescue Dave Forrest aerodrome, access for Fortescue Metals Cloudbreak Mine, 89km WSW of Nullagine, in the Chichester Range. It can also provide coverage down to 15,000 feet for traffic to Newman.

Airservices’ Executive General Manager Projects and Engineering, Mark Rodwell, said that air traffic in Western Australia had grown exponentially in the last five years. ‘For example, Perth Airport has experienced a rise of 12.5 per cent in the last year alone. With so many additional planes flying to and from the Pilbara region, radar provides us with the capability to determine the exact location of an aircraft in real time, enabling us to make safer and more efficient use of airspace, allowing aircraft to operate more efficiently, and reducing pilot and controller workload to further enhance safety.’ Perth itself has received significant upgrades to its ILS (instrument landing system) with the replacement of localiser antenna arrays at the end of each main runway (Runway 03/21).

Increased air traffic volumes have also been the rationale behind Airservices’ decision to give Port Hedland airport a complete makeover, with an aerodrome flight information service (AFIS) and ARFF (the latter previously withdrawn in

‘For example, Perth Airport has experienced a rise of 12.5 per cent in the last year alone. With so many additional planes flying to and from the Pilbara region, radar provides us with the capability to determine the exact location of an aircraft in real time, enabling us to make safer and more efficient use of airspace, allowing aircraft to operate more efficiently, and reducing pilot and controller workload to further enhance safety.’

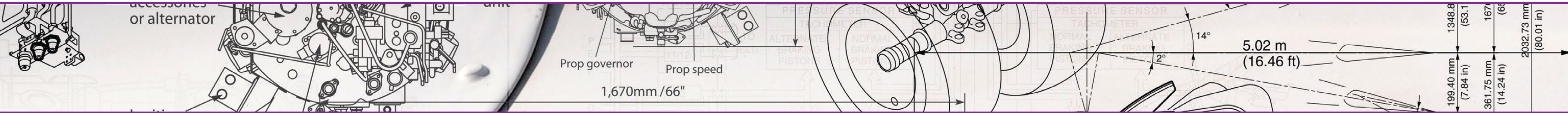
2003 following a steady decline in passenger numbers as the resource sector experienced a downturn). Again, the ARFF will use Rosenbauer Mk 8s, in an interim fire station until the new one is completed in 2014. The AFIS is now providing aircraft with directed traffic information, emergency services alerts and local weather advice.

But Western Australia is not the only state to receive the benefits of Airservices’ safety plans. In March last year, a brand new air traffic control tower was officially opened at Rockhampton Airport. Once again, it is fitted with the latest air traffic surveillance and communications technology, integrating flight and operational data, surveillance and voice communications into one tower-specific design. Standing some 25 metres tall, the new tower is significantly higher than the 50-year-old one it replaced, giving controllers much better visibility of all operational areas of the airport.

A precast concrete structure, the tower is designed to withstand cyclones, flooding and earthquakes. Its 1.3 metre thick slab is reinforced with 10 tonnes of reinforcing steel and 140 cubic metres of solid concrete. Despite being 50mm thick and weighing several tonnes, the windows are particularly special; manufactured to stringent optical, thermal and acoustic performance criteria to ensure there are no distortions or imperfections to interfere with a controller’s view. Gladstone is next on the list for a new tower.

Photo: Broome air traffic control tower and aviation rescue fire station

AIRWORTHINESS



Keeping your Part 66 licence current

The new Part 66 licensed aircraft maintenance engineer (LAME) licence, introduced in June 2011 replaced CAR 31 LAME licences. A major difference between the new Part 66 and the old CAR 31 licence is that Part 66 licences are perpetual.

However, even though the licence is perpetual, international obligations (under the International Civil Aviation Organization's standards and, in particular, the annex relating to personnel licensing) mean that there are recency requirements. As a LAME, your licence is current as long as, within the preceding 24 months, you have either gained your licence, or have had at least six months using any of the A, B1 or B2 licences or ratings you hold.

The recency requirements

As a LAME, you are allowed to certify maintenance or issue a certificate of release to service only if, in the two years immediately before you were granted your licence; you had at least six months experience in exercising the privileges for your licence, or for a rating endorsed on the licence; or you requalified for the licence.

A LAME (category A, B1, B2, or C licence holder) is taken to have had at least six months experience of certifying maintenance and CRS for their licence(s) or rating(s) endorsed on a licence if they hold another A, B1 or B2 licence and they have had at least six months experience of certifying maintenance or CRS, after maintenance has been carried out on the aircraft, using any of the licences or ratings endorsed on that licence.

The term 'carrying out maintenance' includes supervising maintenance. If you are a category B1 or B2 LAME who has been supervising only (not on tools) and using your Part 66 licence to certify maintenance or CRS (within a Part 145 approved maintenance organisation [AMO]) or certifying maintenance or Maintenance Releases (within a CAR30 aircraft maintenance organisation) for six months in two years, then your Part 66 licence and aircraft type ratings remain valid.

Not all LAMEs work a standard day or standard hours with a single employer. Given split shifts and multiple workplaces, literal interpretations of the terms 'months and days' do not always provide enough detail for a LAME to show that they comply with the 'six months experience in a two-year period'.

To ensure accuracy, CASA is amending the Part 66 documents (the manual of standards [MoS] and acceptable means of compliance [AMC]) to give a days and hours alternative to the six-month requirement—that is, 100 days or 550 hours.

What do I do if I haven't been able to maintain Part 66 licence currency?

If you hold an A, B1 or B2 licence, you have to gain six months/100 days/550 hours of practical experience, or obtain a report from a Part 147 maintenance training organisation (MTO). The maintenance training organisation must be authorised for category training and their report must state that they have assessed you and certify that you continue to have the necessary knowledge and skills to hold that category of licence. Your assessment must include both theory and practical assessment across the range of maintenance activities relevant to the licence.

If you are a category C licence holder, an AMO must provide you with suitable continuing airworthiness experience and record an AMO certification that you have re-established your knowledge and skills.

What records do I need to keep?

As a LAME, you need to keep accurate records so that you can show customers and CASA that you comply with these recency requirements. You can record your experience manually in an individual log book, or electronically in a spreadsheet, for example. Your records should include details such as:

- the date
- aircraft type
- aircraft identification i.e. registration
- ATA chapter
- operation performed e.g. 100 FH check, MLG wheel change, engine oil check and complement, SB embodiment, trouble shooting, structural repair, STC embodiment
- type of maintenance e.g. base, line
- type of activity e.g. perform, supervise, release
- category used—A, B1, B2 or C.

These records, when countersigned by a relevant supervisor, become your evidence of experience. You can also use a CASA schedule of experience, or a workplace 'Recent Work Experience Record' worksheet, on which to log experience.

You can find more information about recording recent work experience in CASA's advisory circular (AC) AC 66-7 *Practical Training Options for Aircraft Type Training – POC & OJT, and the Recording of Evidence of Recent Work Experience*. There is an example of a 'Recent Work Experience Record' worksheet in Appendix C of that advisory circular, which you can print and use to record evidence of your on-the-job experience.

Remember!

Your LAME licence remains valid as long as you have been certifying for work you have carried out (including supervised work) for six months within the preceding 24 months.

Employing aspiring Part 66 LAMEs

The Part 66 of the Civil Aviation Safety Regulations (CASR) 1998 approach to basic licensing of aircraft maintenance engineers (LAMEs) is to utilise the competency-based training provided by registered training organisations (RTOs) around Australia under the MEA11 Aeroskills Training Package. If the RTO is to report the qualification to CASA for Part 66 purposes they must hold a Part 147 of CASR 1998 approval. The aeroskills training package provides a nationally recognised qualification (NRQ) under the Australian quality framework standards. Qualifications are issued to successful graduates depending on their enrolled 'certificate' level.

Not all the qualifications provided by the aeroskills training package can provide a CASA Part 66 licence outcome. The aeroskills training package includes 21 qualifications, as per the diagram opposite.

The only competencies and associated qualifications that a Part 147 MTO can currently report to CASA, for the purposes of category A, B1 and B2 licensing, are those listed as using the units of competency required for a category or subcategory of licence; as specified in Appendix IV of the Part 66 MOS.

Within the MEA 11 aeroskills training package those competencies are delivered by the following courses/ qualifications:

- MEA20511 Certificate II in Aircraft Line Maintenance [category A]
- MEA50211 Diploma of Aeroskills (Mechanical) [category B1]
- MEA50111 Diploma of Aeroskills (Avionics) [category B2]

If a student has gained other competencies from other qualifications (e.g. from the Certificate IV in Aeroskills (Mechatronics) the Part 147 MTO must confirm that the CASA 75 per cent pass mark for knowledge, the elements and performance criteria, required skills and knowledge, and the range statement of the relevant Appendix IV of the Part 66 MOS units of competency, have been achieved. Once RPL to that standard has been confirmed, the Part 147 maintenance training organisation can report to CASA that the relevant competencies have been gained for the purpose of licensing, or exclusion removal.

If you are employing personnel who are or will be trained under the aeroskills training package and you expect that they will be licensed under Part 66 at the end of their training, you need to confirm that they are enrolled in (or can articulate to) MEA20511, MEA50211 or MEA50111.

Aeroskills qualifications

Certificate II in ...

- Aircraft Surface Finishing — **MEA20611**
- Aeroskills ** — **MEA20411**
- Aircraft Line Maintenance — **MEA20511**

Certificate III in ...

- Aircraft Surface Finishing — **MEA30111**
- Aircraft Life Support and Furnishing — **MEA30311**
- Mechatronics — **MEA30211**

Certificate IV in ...

- Aircraft Surface Finishing — **MEA40911**
- Aircraft Life Support and Furnishing — **MEA41111**
- Aeroskills (Avionics) — **MEA40611**
- Mechatronics — **MEA41011**
- Aeroskills (Mechanical) — **MEA40711**
- Aeroskills (Structures) — **MEA41311**
- Aeroskills (Armament)* — **MEA41213**

Diploma of ...

- Non-Destructive Testing — **MEA50511**
- Aeroskills (Avionics) ** — **MEA50111**
- Aeroskills (Mechanical) ** — **MEA50211**
- Aviation Maintenance Management (Avionics) — **MEA50311**
- Aviation Maintenance Management (Mechanical) — **MEA50411**

Advanced Diploma of ...

- Non-Destructive Testing — **MEA60311**
- Aviation Maintenance Management (Avionics) — **MEA60111**
- Aviation Maintenance Management (Mechanical) — **MEA60211**

Note 1 – Entry may be at any qualification level.
Note 2 – All qualifications are subject to the relevant Civil Aviation Safety Authority (CASA) and the Australian Defence Force (ADF) regulatory systems.
Note 3 – * This qualification can only be attained through enlistment in the RAAF.
Note 4 – ** These qualifications can be reported to CASA for A, B1 and B2.

Precise information on licensing, current and proposed compliance requirements can be obtained from CASA on telephone 131 757 or at www.casa.gov.au
For further information, go to www.casa.gov.au/maintenanceregs, and click on the Part 66 icon.

18 September – 30 October 2013

Note: Similar occurrence figures not included in this edition

AIRCRAFT ABOVE 5700kg

Airbus A320-232 Brake unserviceable. SDR 510017672
Loose bolts found on brake nos. 3 and 4 following pilot reports of slight 'brake grabbing' during taxi. Brakes sent to Goodrich for investigation. P/No: 21684. TSN: 3643 hours/1778 cycles

Airbus A321-231 Passenger compartment lighting ballast unserviceable. SDR 510017671
Burning smell in cabin. Investigation found row 12 lighting ballast unit 117LG unserviceable and fluid on fluorescent tube. Investigation continuing. P/No: 41972002.

Airbus A330-203 Traffic collision avoidance system (TCAS) unserviceable. SDR 510017656
Investigation continuing. P/No: 751780010100.

ATR ATR72212A Crew station equipment system spring unserviceable. SDR 510017686
Captain's seat outboard spring found to be broken. Investigation continuing. One other similar defect. P/No: 1A5270016. TSN: 2190 hours/1733 cycles.

ATR ATR72212A Overheat detection system control unit unserviceable. SDR 510017728
Engine overheat detection control unit replaced following engine cockpit alert during start. P/No: EL13201. TSN: 4390 hours/4166 cycles

ATR ATR72212A Window wiring lug burnt. SDR 510017705
Evidence of burning on cockpit window heat terminal lug. Investigation continuing. P/No: NSA936501TA1402. TSN: 3306 hours/2911 cycles

BAC 146RJ100 Hydraulic power system isolation valve faulty. SDR 510017731
Cockpit warnings for hydraulic system high temp. Yellow hydraulic system isolation valve replaced. P/No: HTE95313.

Beech 1900C Wing plates/skin corroded. SDR 510017843
Minor corrosion found on inner side of the lower centre belly skin. No further corrosion found. P/No: 11412004937.

Boeing 717-200 Hydraulic system main transfer valve failed. SDR 510017792
R/H hydraulic system low pressure observed shortly after take-off. Investigation found transfer valve cylinder failed. P/No: 3790055102

Boeing 737-800 Cabin cooling system bellows cracked. SDR 510017682
Cabin altitude increased above 10,000ft at FL370. Passenger oxygen system activated. Investigation found bellow in RH air con pack cracked. P/No: AS150518A0042.

Boeing 737-838 Flight control system lever faulty. SDR 510017816
Take-off rejected following take off warning horn annunciation. Speed brake lever suspected to be not correctly stowed.

Boeing 737-8FE Autopilot system unexpected operation. SDR 510017825
Aircraft performed uncommanded left bank, followed by uncommanded right bank. Nil faults in autopilot fault history. Aileron and trim operation checks, cables and runs all tested satisfactory. Investigation continuing.

Boeing 737-8FE Attitude gyro and indicating system ADIRU unserviceable. SDR 510017662
LH Air Data Inertial Reference Unit (ADIRU) u/s. P/No: HG2050AC07. TSN: 35,809 hours/20,560 cycles

Boeing 737-8FE Drag control system spoiler out of adjust. SDR 510017652
Nos. 4 and 9 flight spoilers asymmetrical. Investigation found No. 9 spoiler 1.5 degrees high. Spoiler adjusted.

Boeing 737-8FE Elevator tab control system springs broken. SDR 510017696
Two springs in RH elevator tab mechanism found to be broken. P/No: 251A24391

Boeing 737-8FE Fuel storage gasket unserviceable. SDR 510017692
Fuel leak noticed after take-off. Wing fuel surge tank access panel gasket found to be u/s. P/No: 654A0004499.

Boeing 737-8FE Pressure controller unserviceable. SDR 510017826
Master caution light illuminated on descent through 8000ft. Cabin altitude decreased to 2000ft. Cabin pressure module replaced. P/No: 71231997303AB. TSN: 50 hours/35 cycles

Boeing 737-8FE Trailing edge flap control system transmission unserviceable. SDR 510017678
Water contamination found in No. 7 flap drive transmission. P/No: 256A321010. TSN: 10,510 hours/6191 cycles

Boeing 767-336 APU bleed air system valve faulty. SDR 510017666
APU auto shutdown. Faulty surge control valve. P/No: 97980612. TSN: 9380 hours TSO: 4502 hours

Boeing 767-338ER APU indicating system faulty. SDR 510017708
Speed sensor replaced following APU auto shutdown. P/No: 38760263. TSN: 25,582 hours TSO: 25,582 hours

Boeing 767-338ER Rudder tab control system suspect faulty. SDR 510017707
Rudder ratio message illuminated during climb. Completion of applicable fault isolation manual sections found nil defects.

Bombardier DHC8-102 Flight control system actuator leaking. SDR 510017719
Hydraulic fluid dripping from LH wing inboard and outboard fairings. Leak traced to the RH outboard spoiler actuator piston seal. Actuator replaced. P/No: A44700009

Bombardier DHC8-102 Wheel hub cracked. SDR 510017704
During eddy current inspection for a tyre change a 15mm long crack was found in the bead seat of the inboard hub half. This was most likely caused by metal fatigue. P/No: 300654

Bombardier DHC8-106 Hydraulic system main tube failed. SDR 510017638
No. 2 hydraulic system pressure pipe (tube) failed at flared end. P/No: 82970009325.

Bombardier DHC8-106 Landing gear position and warning system harness damaged. SDR 510017751
Weight on wheels caution light illuminated after take-off. Aircraft returned to port. Investigation found a broken wire at plug. Wiring repair carried out and system tested OK.

Bombardier DHC8-202 Power lever control rod seized. SDR 510017683
Engine condition lever difficult to move. Investigation found condition lever control rod between the quadrant and mechanical fuel control was seized.

Bombardier DHC8-314 Landing gear doors spring hole worn elongated. SDR 510017780
Landing gear RH extension spring upper eye end worn through attach bush and partially through the attach bolt. P/No: 83231020003. TSN: 33,895 hours/30,700 cycles

Bombardier DHC8-315 Airfoil de-ice system distributor valve faulty. SDR 510017661
LH outboard wing de-ice boot failed to deflate. Outboard distribution valve suspect faulty.

Bombardier DHC8-315 Brake anti-skid system suspect faulty. SDR 510017650
Anti-skid lights illuminated when landing gear selected down. Aircraft landed with anti-skid lights on. Investigation found no definitive cause and the system eventually tested serviceable.

Bombardier DHC8-315 DC generator failed. SDR 510017668
No. 1 DC generator failed. Investigation found faulty generator control unit (GCU).

Bombardier DHC8-315 Electrical power system odour. SDR 510017648
Strong electrical burning smell. Electrical mission equipment turned off and smell dissipated. Investigation continuing.

Bombardier DHC8-315 Navigation system failed. SDR 510017660
GPWS and de-ice boot warning lights. Investigation found automatic flight control system (AFCS) interface box faulty.

Bombardier DHC8-315 Stall warning system stick shaker intermittent. SDR 510017773
One second intermittent stick shaker event with autopilot engaged. Investigation continuing.

Bombardier DHC8-402 Landing gear steering system suspect faulty. SDR 510017802
Nose wheel steering unresponsive on take-off. Investigation revealed over-pressurisation of NLG shock strut.

Bombardier DHC8-402 Ice detection probe faulty. SDR 510017632
Propeller de-ice warning. Faulty static air temperature (SAT) probe.

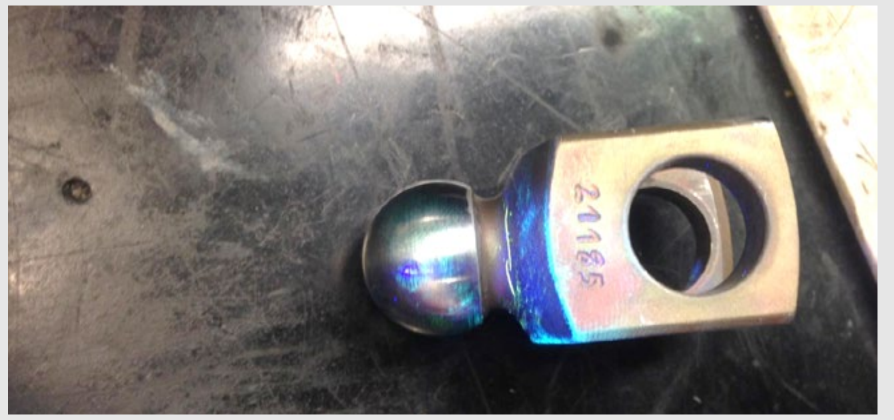
Bombardier DHC8-402 Trailing edge flaps failed extend. SDR 510017828
Trailing edge flaps failed to extend. Maintenance lubricated flap select lever and trigger mechanism. Operational check satisfactory.

Bombardier DHC8 Drag control actuator – clutch manufacturing fault. SDR 510017763
Flight spoiler clutch assembly missing sleeve spacer. One other similar defect. P/No: 8274006102001

CASA C212200 Power lever cable frayed. SDR 510017647
RH engine speed lever control cable frayed. Another two cables in a similar frayed condition. P/No: LN936124N46L2670.

Embraer EMB-120 Engine torque indicating system suspect faulty. SDR 510017655
No. 1 engine torque signal condition unit (TSCU) suspect faulty. Investigation continuing. P/No: 3005000052. TSO: 886 hours/886 cycles

Embraer EMB-120 Landing gear steering system link cracked. SDR 510017657
Nose wheel steering link ball joint cracked. Found during magnetic particle inspection (MPI). P/No: 2118500000. TSN: 30,119 hours



Embraer ERJ-170 Hydraulic system main shutoff valve unserviceable. SDR 510017794
Hydraulic shutoff valve replaced following inspection iaw AD2007-02-01.Two other similar defects. P/No: 9752873. TSN: 9761 hours

Embraer ERJ-190-100 Cabin cooling system aircycle machine failed. SDR 510017646
No. 2 air cycle machine (ACM) failed. Investigation found fan rotor blade missing. P/No: 10007004. TSN and TSO: 14,287 hours/9800 cycles/9800 landings/63 months

Embraer ERJ-190-100 Stabiliser position indicating control unit fault message. SDR 510017833
After landing a no dispatch message occurred with no pitch trim indication. Horizontal stabiliser actuator control unit replaced. Operational testing produced nil defects. P/No: 4165001005. TSN: 14,681 hours/10,142 cycles.

Fokker F27MK50 Fuel boost pump unapproved part. SDR 510017709
Fuel pump sent to OEM following intermittent faults. Suspected unapproved part. P/No: 1C275.

Fokker F28 MK0100 Aircraft fuel line worn. SDR 510017675
LH main fuel rigid supply line found to have minor chaffing causing fuel leak. Fleet inspection found one other installation with similar chaffing where hydraulic line was in close proximity. P/No: 1159P416427.

Fokker F28 MK0100 APU smoke/fumes. SDR 510017748
Pilots reported bad smell of contamination below 10,000ft and on the ground. Pack recirculation filters removed for lab testing and found to have oil impregnation.

Fokker F28 MK0100 Landing gear door hinge cracked and corroded. SDR 510017688
During scheduled maintenance the LH main landing gear (MLG) outboard door hinge lug was found to be partially missing. Damaged section found with corrosion and cracks.

Fokker F28 MK070 Fuselage attach fittings hinge bracket cracked. SDR 510017633
LH and RH upper and lower speed brake hinge support brackets cracked. Found during inspection iaw SBF 100-53-113.

AIRCRAFT BELOW 5700kg

Beech 76 Wing spar corroded. SDR 510017726
Corrosion found around lower LH and RH wing spar rivets behind engine nacelles/wheel well. Skins and spars also corroded.

Britton Norman BN2A27 Fuel tank water contamination. SDR 510017636
Engine power loss. Water in carburettor and accelerator pump faulty. Further investigation found water contamination of the LH main fuel tank.

Cessna 172RG Hydraulic pump electric motor open circuit. SDR 510017703
Gear failed to retract after take-off. Gear selected down and extended manually. Hydraulic power pack motor armature found to have one open circuit winding. P/No: 98811281. TSO: 2739 hours

Cessna 182Q Battery/charger system unserviceable. SDR 510017690
Evidence of battery acid spill found by MRO during annual inspection. Battery replaced.

Cessna 206H Elevator tab control system sprocket sheared. SDR 510017635
Elevator trim tab actuator drive sprocket failed. P/No: 12601131. TSN: 686 hours/215 cycles/215 landings/6 months

Cessna 210L Fuselage bulkhead cracked. SDR 510017781
During routine inspection tail cone bulkhead found to be cracked. P/No: 1212131-5. TSN: 9199 hours

Cessna 441 Landing gear doors angle broken. SDR 510017809
Angle bracket attaching the forward end of the main landing gear door hinge was found to be broken, allowing the door to twist back in the airflow and bend the hinge assembly. P/No: 572730223.

Cessna 441 Wing spar cap corroded. SDR 510017725
Wing spar cap corroded. Found iaw Cessna SIDs Phase 55 inspection. P/No: 58221661. TSN: 6980 hours/5789 landings/420 months

Czech Aircraft Works PiperSport Landing gear/ wheel fairing bracket failed. SDR 510017756
Wheel spat mounting brackets found cracked during inspection. TSN: 350 hours/1024 cycles

Gulfstream G73AT Landing gear attach fittings corroded. SDR 510017645
Nose landing gear LH and RH trunnion blocks P/Nos. 112329L and 112329R had corroded support doublers. P/No: 1073283. TSN: 5290 hours/99 months

Pilatus PC12 Pitot tube unserviceable. SDR 510017654
Pitot tube internal deflector plate broken and moved from correct position in front of pressure sensing port. P/No: 9651112302. TSN: 5888 hours/5189 cycles

Piper PA23 Elevator control system pulley unserviceable. SDR 510017805
Two elevator pullies found with nuts missing from attaching bolts. Lower pulley cable keeper also missing. Entire aircraft control system inspection continuing. P/No: 481624PIPERPN. TSN: 5025 hours

Piper PA31350 Nose landing gear strut/axle fork cracked. SDR 510017776
During scheduled maintenance the nose gear fork assembly at the axle lug was found with extensive fatigue cracking. P/No: 4533303. TSN: 13,591 hours

Piper PA44180 Engine mount section cracked. SDR 510017837
Engine mount frame cracked at dyna mount plate. P/No: 8621202LH. TSN: 11504 hours

Piper PA44180 Main landing gear attach section trunnion cracked. SDR 510017841
RH main landing gear trunnion cracked at 1 of 4 bolt holes. Found when carrying out SB 1161. One other similar defect. P/No: 6704015. TSN: 11,504 hours

Piper PA44180 Wing skin cracked. SDR 510017811
6.7 inch crack found in the RH wing aft bottom skin between WS115.29 and 108.59. P/No: 86560007.

Piper PA44180 Wing ribs cracked. SDR 510017840
LH and RH wing ribs cracked in locations described in SB 116. P/No: 78475006LH7847507RH. TSN: 11,504 hours

Swearingen SA227DC Wing attach fitting cracked. SDR 510017830
LH forward spar wing attach fitting cracked. Defective part was replaced and tracked for future inspection intervals iaw SB CC7-53-006. P/No: 2722121011. TSN: 23,889 hours/28,105 cycles

Swearingen SA227DC Wing attach fitting cracked. SDR 510017831
LH aft wing attach fitting found to be cracked. Replacement fitting subject to re-inspection intervals iaw SB CC7-53-006. P/No: 2722123011. TSN: 23889 hours/8105 cycles

COMPONENTS

Simmonds Precision Products Indicator incorrectly marked. SDR 510017754
Fuel quantity indicator had an adhesive label stuck over it. Suspected unapproved part. Investigation continuing. P/No: 10026000002.

PISTON

Continental IO520 Reciprocating engine cylinder section piston ring missing. SDR 510017761
Compression rings found missing on three cylinders following low engine compression test Engine had been factory remanufactured. Cylinders 1, 3, and 5 replaced. P/No: 658175A1. TSN: 303 hours

Lycoming IO540K1A5 Engine exhaust muffler cracked. SDR 510017741
During 100-hourly inspection, the R/H muffler assembly was found to be u/s. Muffler slip joint flange cracked and tailpipe outlet severely cracked. P/No: GA8781011124. TSN: 1896 hours

Lycoming LTIO540J2BD Engine collector/tailpipe/nozzle exhaust pipe bulged. SDR 510017758
Exhaust pipe found bulging when inspected iaw AD 2013-10-04. P/No: LW10160. TSO: 1429 hours

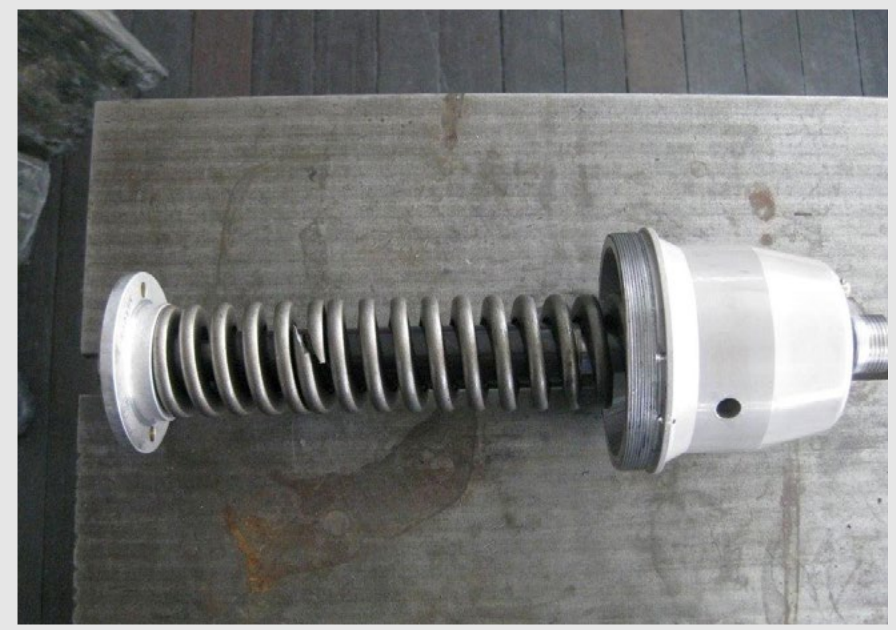
Lycoming O360A1H6 Reciprocating engine cylinder section manufacturing fault. SDR 510017801
Pre-installation inspection found manufacturing flaw in cylinder casing near spark plug port. P/No: SL36006WA20P.

Lycoming O540B2B5 Magneto/distributor loose. SDR 510017679
Gear bearing in distributor block found loose following "an uncommanded engine stop on take-off. Installation of a new distributor block and gear corrected the fault. P/No: 10357426. TSN: 1085 hours/84 months TSO: 40 hours/3 months

PROPELLER

Hamilton Standard 14RF19 Propeller blade section pitch control incorrect modification. SDR 510017775
A number of pitch control units (PCUs) assembled incorrectly by the vendor. This incorrect assembly returns the PCUs to a pre-SB configuration which can reduce reliability. P/No: 78249055AND78249052.

Hartzell HCB4MP3C Propeller assembly spring cracked. SDR 510017765
Broken spring found during dismantling of the propeller at overhaul. The spring is of the old style referred to in Hartzell service letter HC-SB-61-324. P/No: A3496. TSN: 10,254 hours TSO: 2518 hours/43 months



ROTORCRAFT

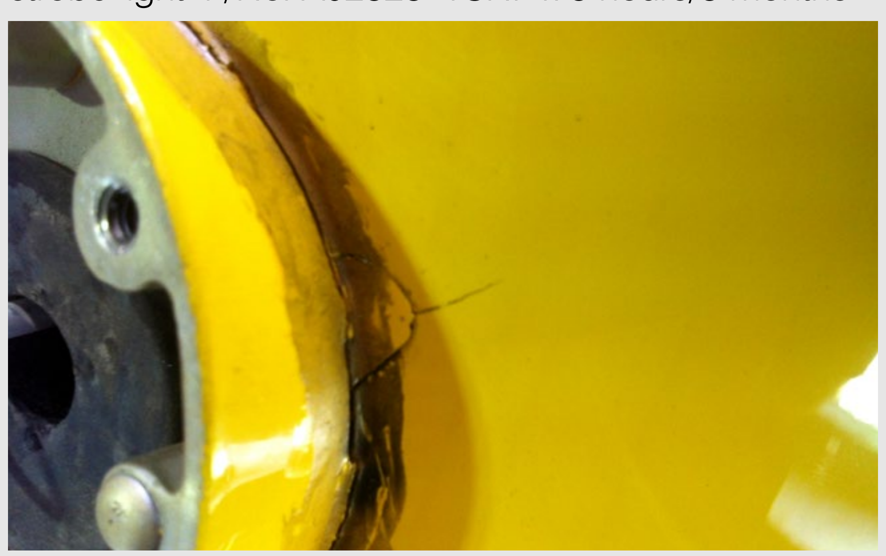
Agusta Westland AW139 Rotorcraft tail boom creased. SDR 510017827
24-inch crease found on tail boom during post-flight inspection. No significant torque events noted during flight. Investigation continuing. P/No: 3G5350A00134. TSN: 2413 hours/6628 cycles.

Bell 206B Main rotor drive system TT strap manufacturing fault. SDR 510017759
New tension torsion strap found to have a crack/split in the plastic coating covering the wire wrap. Crack/split found to penetrate the full thickness of the wall. Investigation continuing. One other similar defect. P/No: AA206011154107REVB.

Bell 429 Main rotor head bearing sheared. SDR 510017643
Main rotor head elastomeric bearing sheared and rubber separated from steel journal. Investigation could not find root cause. P/No: 429310002101. TSN: 522 hours.

Eurocopter EC225LP Life raft incorrectly routed. SDR 510017822
Life raft found incorrectly secured and not connected to the bottle percussion head. P/No: 00051055. TSN: 2413 hours/6628 cycles.

Robinson R22Beta Rotorcraft tail cone cracked. SDR 510017829
Strobe light on tail cone found loose during 100-hourly inspection. Crack in the tail cone at the base of the strobe light. P/No: A02323. TSN: 473 hours/8 months.



Sikorsky S76A Hydraulic pump failed. SDR 510017718
Hydraulic pump failure. Precautionary landing carried out after caution warnings and No. 2 hydraulic pressure fluctuating. Metallic contamination in the system. P/No: 7665009808102. TSN: 3450 hours

Sikorsky S92A APU exhaust pipe worn and damaged. SDR 510017714
Hole found in APU exhaust during daily inspection. P/No: 9230302301043.

TURBINE ENGINE

Garrett TPE33111U612 Engine bleed air system unserviceable. SDR 510017819
Bleed air line found leaking into engine fire warning detector following fire warning annunciation. P/No: 2762100009.

Garrett TPE33112UH Engine bleed air lines leaking. SDR 510017839
Fleet check following occurrence of SDR 510017819 found two other bleed air lines leaking into engine bay. P/No: 2762100109. TSN: 27832 hours/30486 cycles

GE CF680C2 Thrust reverser relay failed. SDR 510017844
Hot start protection check found defective iaw CASA AD-B767-183. Relay replaced. P/No: KLX4A011.

PWA PT6T3D Fuel heater leaking. SDR 510017710
Fuel leak in engine noticed. Fuel heater cracked at weld cross section. P/No: 0544E. TSO: 2482 hours

Rolls Royce Trent 97284 Turbine engine fumes. SDR 510017782
Oil fumes smelt in cockpit on take-off. Engine 3 bleed switched off and smell dissipated.

REGULARS

Photo: Thinkstock

FLYING OPS

1. The maximum speed for full control deflection, or for manoeuvres involving the approach to a stall, is abbreviated as:

a. V_{ne} and is usually marked as a red line on the airspeed indicator.
b. V_{no} and corresponds to the beginning of the yellow band on the airspeed indicator.
c. V_a and is usually not marked on the airspeed indicator.
d. V_{fe} and corresponds to the top of the white band on the airspeed indicator.

2. One advantage of fuel tanks in the wing of a low-wing aircraft is that:

a. aerobatics are permissible.
b. no fuel pumps are required.
c. a constant average fuel pressure is applied to the carburettor.
d. the engine can be operated when the aircraft is inverted.

3. When manually extending the landing gear (by engaging and rotating a handle) on an aircraft with a DC electric motor-powered undercarriage gearbox, the motor circuit breaker should:

a. be opened to allow the manual extension to engage.
b. be opened to prevent the gear motor from starting unexpectedly and injuring the operator.
c. be checked as closed before attempting the extension.
d. not be touched unless it has tripped.

4. The name *Sceliphron laetum* refers to:

a. the Australian mud-dauber wasp that is known to build nests in pitot tubes and fuel tank vents.
b. a bacterium that breeds in turbine fuel and forms a gelatinous contaminant.
c. microscopic algae that grow in turbine fuel and form a gelatinous contaminant.
d. the Latin motto of the now disbanded DCA Flying Unit.

5. At a particular location, an AFRU + PAL system is provided on the CTAF frequency. Attempting to activate the PAL system by three bursts of two seconds of carrier on the CTAF will:

a. not turn on the lights because the three bursts must be completed within five seconds.
b. not turn on the lights because the third burst must be finished after five seconds have elapsed.
c. not turn on the lights because each burst must be at least three seconds in duration.
d. turn on the lights.

6. Taxiway centre lighting is coloured:

a. blue and the edge lighting is white.
b. white and the edge lighting is blue.
c. blue and the edge lighting is green.
d. green and the edge lighting is blue.

7. A mass balance on a control surface is designed to:

a. move the centre of gravity of the control surface forwards in order to increase its stability.
b. increase the inertia of the surface to provide more feedback to the pilot.
c. move the centre of gravity of the control surface back in order to increase its stability.
d. provide more aerodynamic balance in order to reduce control forces.

Photo: CASA

8. In a multi-spool turboprop engine, the gas generator consists of a:

a. low-pressure compressor driven by a high-pressure turbine.
b. low-pressure compressor driven by a low-pressure turbine.
c. high-pressure compressor driven by a high-pressure turbine.
d. high-pressure compressor driven by a low-pressure turbine.

9. When an aircraft with a constant speed propeller is in stable cruise and the nose is then slightly lowered to initiate a descent, the aerodynamic loads on the propeller are:

a. reduced and the governor compensates by setting the blades to a coarser pitch.
b. reduced and the governor compensates by setting the blades to a finer pitch.
c. increased and the governor compensates by setting the blades to a coarser pitch.
d. increased and the governor compensates by setting the blades to a finer pitch.

10. A vertical gyro is capable of providing the following information to aircraft systems:

a. the angle and rate of pitch and the angle and rate of yaw.
b. the angle and rate of pitch and the angle and rate of roll.
c. the angle and rate of roll and the angle and rate of yaw.
d. the angle and rate of roll and the rate of turn.

Photo: CASA

Flying ops answers
1c. 2c. 3b. Injury has occurred because the motor has been known to start operation without warning. **4a.** Australian mud-dauber wasp (Sceliphron laetum). **5a.** The transmitter keying requirements are different between the PAL system and the AFRU + PAL system. See ERSA Intro.-23.4 & 23.5 and AIP. **6d. 7a. 8c. 9a. 10b.**

MAINTENANCE

1. Referring to a radar transponder, the correct skin code is verified:

a. on initial installation or issue of a CoA and each time the transponder is tested.
b. on request by ATC.
c. by operating the test function on the control panel.
d. automatically on power-up.

2. An accelerometer utilises the property of the:

a. inertia of a mass.
b. gravitational force on a spring.
c. length of a pendulum.
d. resonant frequency of a mass and spring combination.

3. On a typical turboprop aircraft pneumatic de-icing system, an ejector is used to:

a. adjust the rate of cycling of the pneumatic boots.
b. clear moisture from the system in the event of perforation of a boot.
c. regulate and cool compressor bleed air to inflate the boots.
d. provide a vacuum to deflate the boots by using a bleed air venturi.

4. On a simple engine-driven vacuum pump system for gyro instruments employing a common filter for air entering the instruments, the need to clean or replace the filter is indicated by:

a. a high vacuum reading.
b. a low vacuum reading.
c. unreliable instrument indications accompanied by a low vacuum reading.
d. unreliable instrument indications.

5. During starting of a turboprop engine, a starter-generator is configured as a:

a. shunt motor and then a compound generator for power generation.
b. series motor and then a shunt field generator for power generation.
c. series motor and then a synchronous generator for power generation.
d. shunt motor and then a shunt generator for power generation.

6. Selection of the 400Hz frequency used in many aircraft electrical systems is a compromise between the reduction in the weight of transformers and AC motors with rising frequency and increasing:

a. conductor losses due to skin effect.
b. base speed of AC electric motors.
c. capacitive losses between conductors.
d. inductive losses along conductors.

7. Intumescent paint has the property of:

a. absorbing heat and changing state to one of lower thermal conductivity when subjected to high temperatures, and is used in flight voice and data recorders.
b. very low thermal conductivity once cured.
c. high thermal conductivity, and is used to enhance the heat conductivity between semiconductors and heat sinks.
d. very effective corrosion protection for magnesium alloys.

Photo: CASA

Photo: CASA

8. The current CASA document covering aircraft wiring and bonding is:

a. CAAP 42L-5(0)
b. AC 21-99(1), which replaced CAAP 42L-5(0)
c. CAAP 42L-5(0), which replaced AC 21-99(1)
d. AC 42.13-1B and -2B.

9. ATA Chapter 35-20 refers to:

a. crew oxygen.
b. passenger oxygen.
c. navigation.
d. lighting.

10. Standard hardware part number MS21080 refers to:

a. a one-lug anchor nut.
b. a thin self-locking nut.
c. an electrical nut.
d. a pal nut.

Maintenance answers
1a. 2a. 3d. 4d. 5b. 6a. 7a. 8b. 9b. 10a.

Darwin runway 11 NDB approach (plate effective 30 May 2013)

You are the pilot in command of a Cessna 310R (category B) operating IFR with the following equipment available in the aircraft:

- 2 serviceable ADFs (1 RMI and 1 fixed card)
- 1 DME
- 1 serviceable TSO 146 GPS with RAIM available
- 1 set of marker beacons
- The ILS/VOR indicator is continually displaying an NAV unserviceability flag, even though, when selected to the ILS frequency, the correct Morse identifier can be heard. You prudently decide not to use this equipment.

A current NOTAM advises that the Darwin (DN) VOR and DME are not available due to maintenance.

You have been cleared inbound to DN VOR along A461 at 8000ft. You are in IMC with the following relevant ATIS items:

- Runway 11
- Wind: 100/15
- Cloud: Broken 700'
- Visibility: 3000m in rain

Your instrument rating is endorsed for both 2D and 3D approaches.

The following questions relate to the runway 11 NDB approach.

1. Which of the following is correct concerning the definition of the type of approach that the runway 11 NDB is?

a. It is a 3D IAP providing CDI lateral guidance.
b. It is a 3D IAP providing bearing azimuth guidance.
c. It is a 2D IAP providing CDI lateral guidance.
d. It is a 2D IAP providing bearing azimuth guidance.

2. What recency requirement must you have achieved to fly both IFR and this approach?

a. Must have flown at least three IAPs (of any type) within the previous 90 days to meet both IFR and approach recency.
b. Must have flown at least three IAPs (of any type) within the previous 90 days to meet IFR recency, and a 2D IAP within the previous 90 days, to meet approach recency.
c. Must have flown at least three IAPs (of any type) within 90 days to meet IFR recency, and a 3D IAP within 90 days to meet approach recency.
d. Must have flown a 2D IAP within the previous 90 days. This will meet both IFR and approach recency.

3. Refer to the alternate minima. What is the significance of the double asterisks?

a. They refer to a special alternate minima of 1097ft and 4.4km visibility that can be used if the aircraft has duplicated ADFs (which it does).
b. They refer to a special alternate minima of 800ft and 4km visibility that can be used if the aircraft has duplicated VOR/ILS, ADF and marker beacons or markers and DME/approved GNSS (which it doesn't).
c. They refer to a special alternate minima of 800ft and 4km visibility that can be used if the aircraft has duplicated ADFs (which it does).
d. They refer to a special alternate minima of 800ft and 4km visibility that can only be used if you have a METAR/SPECI or forecasting service available. Otherwise revert to 1097ft and 4.4km visibility.
e. Both b. and d. are correct.

Photo: © Bombardier

DN APP clears you to descend to 3000ft and track direct to BAGOT (BGT) locator. Once on the track to BGT, you see that the heading is 320.

4. What is the sector entry at BGT?

a. Sector one (parallel).
b. Sector two (tear drop).
c. Sector three (straight-in) but with an approach clearance from ATC you may go straight into the initial approach leg.
d. Sector three, but a pattern will be required to position correctly for the initial approach track.

DN APP clears you for the runway 11 NDB approach. Overhead BGT you commence timing, intercept the initial approach track (noting 10 degrees left drift), and select gear down.

5. What indications will you see on the RMI and fixed card ADF respectively?

a. RMI TR 301 HDG 311 fixed card ADF 170R
b. RMI TR 311 HDG 321 fixed card ADF 170R
c. RMI TR 301 HDG 299 fixed card ADF 190R
d. RMI TR 311 HDG 301 fixed card ADF 190R

6. Which of the following would be a correct NAVAID selection to obtain distance information for this approach?

a. DN TACAN (paired frequency 113.7)
b. DN VOR 112.6
c. GNSS reference waypoint DN VOR
d. GNSS reference waypoint BGT NDB

At the completion of the outbound timing you commence the left turn inbound to intercept the final approach track of 106. Established inbound on 106, you note the distance readout is six miles, altitude 1600.

7. Which of the following is correct with regard to further descent?

a. Since you are established on track within 10 degrees and within 8 miles, you can descend to MDA.
b. Since you are established on track within ½ scale deflection and within 8 miles, you can descend to MDA.
c. Since you are established on track within 5 degrees and within 8 miles, you can descend to MDA.
d. Since you are established on track within 5 degrees, you can descend to MDA. There is no distance requirement.

DN APP clears you to contact DN TWR on 133.1. You establish contact and TWR advise that the wind is backing now to 020 at 20 knots. Considering the crosswind on runway 11 with the wet runway, you elect to circle to runway 36 for landing.

8. What is the minima you can now descend to for cloud break?

a. MDA 700ft, visibility 2.4 km.
b. MDA 600ft with known QNH (ATIS), visibility 2.4km.
c. DA 700ft, visibility 2.4km.
d. DA 500ft with known QNH (ATIS), visibility 2.2km.

9. With regard to this circling approach, you must have conducted such an approach during your most recent instrument proficiency check (IPC). True or false?

a. True
b. False

10. Should the published missed approach be necessary to join the holding pattern at Howard Springs NDB (HWS), which of the following best describes the manoeuvre to establish inbound in the pattern and on what track?

a. A sector 2 (tear drop) to an inbound track of 286.
b. A sector 1 (parallel) to an inbound track of 286.
c. A left-hand 80-degree procedure turn (026) to establish inbound on 286.
d. A right-hand 80-degree procedure turn (026) to establish inbound on 311.

IFR answers

1d. CASR Part 61 Para 61.870 (6) and definition of azimuth bearing (ADF/NDB) in Para 61.010. **2b.** CASR Part 61 Para 61.870 (2) and (4). The 3D approach is the ILS. All the others are 2D. **3e.** AIP ENR 1.5-34 Paras 6.2.1 and 6.2.2 and approach plate. **4c.** AIP ENR 1.5-25 Para 3.3.4c.1.5 - 17 Para 2.4.1 a and b. **5a.** Category B TR is 301 so the RMI needle tail will indicate this when established. The left drift means the compensating HDG will be 311 and thus the fixed card ADF will show 170 Relative (311- 10 degrees drift= 301 TR). **6c.** Approach plate.

NB: DN TACAN not to be used with this approach (see note). DN VOR/DME NOTAMed out of service. GNSS may be used, reference waypoint, Darwin VOR. **7d.** AIP ENR 1.5- 15 Para 1.21.2 DAP 1-2 Note 3 The 8 DME restriction only applies to the NDB/DME (or GNSS) version and not the overhead timing version that you are using. **8a.** Approach plate circling MDA not DA, which is only ILS landing minima, AIP GEN 2.2- 7 DA definition. NB: AIP GEN 2.2- 16 MDA definition. Note that the minima boxes are not shaded, so the MDA cannot be adjusted for QNH. In other words, it is already done, with H24 ATC and ATIS. AIP ENR 1.5- 34 Para 5.3.2. **9a.** CASR Part 61 Para 61.860 (3). **10c.** Approach plate AIP ENR 1.5- 20 Para 2.7.2 b.

CAVOK confusion

Name withheld by request

A young pilot discovers a sky full of difference between two abbreviations that are sometimes taken to mean the same thing.

CAVOK … thank goodness for that. It had been a long time since I'd seen that on a forecast. (For the uninitiated, it means ceiling and visibility are OK.) I had been hanging out on Groote Island for three wet and miserable days. This wasn't part of the plan, and what a meticulous plan it had been. We had left Bankstown seven days before on the trip of a lifetime: my mother, my best buddy's parents and I. My IFR instructor was supposed to come with us, but she had to pull out at the last minute with the comforting words … 'It's the dry season, you'll be lucky to see a cloud!'

I had pulled off a trifecta. I had planned an awesome trip around Australia in a Partenavia; my passengers were going to help pay for my trip, and a multitude of multi-command hours; and, at the last minute, I had been approached by the owner of an immaculately refurbished Cessna 310 who wanted some hours on it and had given me the most awesome rental rate. Until then I had only flown for 250 hours. I had to pinch myself at my luck.

I planned the trip thoroughly: every overnight, every tour, every fuel stop, every alternate. Nothing was left to chance.

I completed my C310 endorsement in good time, and was impressed that it was fitted with a Trimble 2000 GPS. I read the manual, but my instructor assured me that if I could use the direct-to (DTO) function, I would have it made.

At last, we departed Bankstown and settled back into the huge, newly leather-upholstered seats of the immaculate 310. Lunch at Bourke, overnight at a farmstay near Cunnamulla. Day two, lunch at Burke and Wills Roadhouse, refuel at Burketown, dodge a few clouds and up to Sweers Island for some fresh barra fishing.

Then the heavens opened.

We had planned three days on Sweers Island, but after 24 hours, the dirt strip was so waterlogged that I decided we had better leave while we could, make a fuel stop at Borroloola, then head up to Jabiru for the night.

It was pretty clear over water, but every attempt to cross the coast to Borroloola was met with a wall of cloud almost down to the ground. After several attempts I elected to divert to Groote Island. A sealed strip and fuel were what I needed right then.

Fuelled and watered, weather checked and several local pilots consulted; it was apparent that we would not be flying VFR to Jabiru any time soon. We found a hotel. Next morning was no better. By lunchtime, my tourists were getting a little frustrated, so I put them on an RPT flight to Darwin. At least I wouldn't have the peer pressure to contend with, but I was starting to feel like a goose.

Next day it was decided that I would fly directly to Kununurra, so my passengers could get an RPT flight to meet me there, after taking a few tours out of Darwin.

Day three on the island and bingo … Kununurra was finally CAVOK!

I set off into blue skies. The cloud had abated, but not disappeared, and was far more stratiform. A scattered layer at about 2000 feet thickened up and raised a little as I hit DTO Tindal, with clearance given at 8000 feet. I was making good time, and with no pax, I had heaps of fuel for my trip.

I noticed that I was now over a solid layer of cloud. I was VFR on top, what could go wrong? I was on the radar, tracking direct to Tindal by GPS. I passed over Tindal and hit DTO Kununurra, thinking nothing of it when Tindal asked me if I was IFR capable. Tindal passed me over to Brisbane and when they asked me what my endurance was I felt a bit worried.

All of a sudden it dawned on me—CAVOK; who doesn't expect clear blue skies, light winds and perfect flying conditions? Thinking about it though, didn't it actually mean no cloud below 5000 feet, or the highest 25nm? Well, I was at 8000 feet, and there was a layer of cloud between both those altitudes and me. I also did not have an instrument rating.

The rest of that flight was a nightmare. As I sweated, it looked as though the cloud was thinning, but was this just a mirage? While I contemplated my options, and indeed my possible fate, the cloud thinned out and by the time I got to Kununurra, it was completely SKC (sky clear).

Three days in Kununurra and the dry season set in. We didn't see a cloud for the rest of our trip. It was awesome.

I learnt many things on that trip, and am now an airline pilot of 5000 hours, but I have never learnt a lesson as well as the difference between CAVOK and SKC. If just one person who reads this loses the fanciful vision of blue skies down to the ground when they see CAVOK on a forecast, it will have been worth me telling this tale.

BIRD DOG DISTRACTION

Name withheld by request

Distraction by a fellow pilot's skills caused this embarrassed aviator to review his limitations.

The Cessna 305, or Bird Dog, made its debut overhead the jungles during the Vietnam War. I was excited to be flying this aircraft for my first paid flying job. Boy was I rapt!

Inspections of power lines and the vegetation surrounding them were made from a few hundred feet above ground level. Early morning flying was magnificent, with slivers of orange sunlight peeping over the horizon and the pristine crisp autumn air of outback NSW. Inspecting powerlines has to be one of the most challenging, demanding and exciting jobs around.

Tailwheel Cessnas that have not been ground looped are rare in Australia, so my chief pilot made sure I had a thorough checkout in the machine so as not to add to the statistics.

The start of my first day went well. With the first two sorties going to plan, and after four hours of flying, I was feeling a little less tense. After a bite to eat, it was time to head back to base. I went to top up the oil as the old Continental engine was a little thirsty. Opening the cowls, I removed the locking pin on the oil filler cap and started to pour in a litre of oil. Just at that moment a glider commenced a winch launch close by, and climbed out in front of me at an impressive angle. 'Wow, that looks cool', I thought as I finished topping up the oil and then closed and fastened the cowls, with their locking pins facing rearwards.

THEN I CRANED MY HEAD AGAINST THE PERSPEX WINDOW AND MY HEART SANK.

Start up; the usual company pre-take-off checks were completed without any abnormal readings, a thumbs up from my observer in the back and smoothly and gently, I applied full power, my feet finely see-sawing the rudder pedals to make a good quality take-off for a budding amateur. Departure track was 175 degrees and cruising altitude was 1500 feet. I smoothly rolled left onto departure heading while passing over the rural township.

Unknown to me were the droplets of black oil tracing my departure from the parking bay. After ten more minutes of spraying oil droplets across the countryside, my oil pressure gauge thought it was time to let me know what was happening by dropping into the red. I quickly glanced to the side of it, but the oil temperature was only slightly higher than normal.

Then I craned my head against the Perspex window, and my heart sank.

Slick glistening black oil covered the left wheel and strut. (During my initial checkout I has been told that in the unlikely event of the oil filler cap being left off, the C305 would not siphon the oil onto the windscreen like most Cessnas, but would deposit it outside the cowls onto the fuselage and left gear leg.)

What an idiot! I had left the oil cap off the engine after topping up. My immediate thoughts were: Where shall I land? How long have I been flying? How long do I have before my engine stops? I will lose my job! What is my rear observer going to think?

Automatically, I reduced power to not much more than idle, and chose a slightly upward sloping sheep paddock among the gentle rolling hills to put the Bird Dog down. After landing, the sheep quickly gathered at an inquisitive distance to see this red and white oily-looking machine, with a very red-faced pilot to match. I quickly topped up the oil with the four-litre bottle in the rear of the aircraft kept (obviously) for the occasion. After checking that everything was back in place and oil cap on, I took off and flew back to base. The remainder of the trip was flown in silence. The boss was definitely not impressed, but thankfully did not fire me.

Some reflections on my flying that day:

- When I was filling up the oil, I was distracted by the glider launching. I shut the cowls up and put their pins back in place, but didn't check the oil filler cap.
- After I jumped back in to take off from the paddock, I noticed I had left in such a flap that I had left the master and the mags on.
- Fatigue. It had been a very early start and now was well past lunch. I make more mistakes when I am tired, and therefore need to be extra vigilant, or just not fly.
- After landing in the paddock I should have talked to the chief pilot before flying again.
- What would the outcome have been if I had been flying over ocean, forest or mountains?

This incident was one of the best things to happen to me in aviation. It highlighted several things, as well as lowering my pride a notch or two. Since that day I have made a habit of doing a thorough inspection of my aircraft before I take to the air. Twelve years later, after flying over foreign countries, unhospitable deserts, oceans and dense jungles, I am thankful for the lessons learnt over the sheep paddock that day.

Ever had a close call?

Write to us about an aviation incident or accident that you have been involved in. If we publish your story, you will receive $500. Articles should be between 450 and 1400 words. Submit your close call by emailing **fsa@casa.gov.au**

Too tired to glide?

Name withheld by request

I had flown a Cessna 182, along with three friends, to a nearby glider field, so we could all have some gliding experience and enjoy the hospitality of the gliding club for a few hours. This wasn't the first time, so I was well versed about the extended time on the ground and the extra ground handling tasks while waiting for your turn to go flying. Gliding is a very labour-intensive exercise, and probably requires more patience than many people expect. However, I eventually got a couple of flights in, as did my friends.

The glider being used for training flights that day was the LET13 Blanik, and the club had essentially given us sole use of the aircraft and one instructor for the day, as other flying was mainly being done in the single-seaters. For aero-towing duties, the club had an old Piper Tri Pacer, with barely enough power to launch the Blanik, but that only added to the training value of the exercise! With the Blanik and several single-seaters flying, the Tri Pacer was kept fairly busy for most of the day, only stopping for fuel and a brief rest at lunch for a BBQ.

My group had decided to finish by around 1600, in order to leave us time to fly home and put the 182 to bed by a civilised hour, so at the appointed time, with no further flights likely for the Blanik, it was decided that I would go along for the final ‘hangar flight’ and take some photos at the same time. Since I would not be flying it, and it would essentially be just a launch, fly past and landing, I wasn't even being charged for it. Win!

As we strapped in for the flight, Neville, the instructor, commented that it had been a great day, but he was glad this was the last flight because he was feeling quite fatigued. Essentially, he'd been in the seat all day, only getting out for lunch and a couple of toilet breaks. I gave it no further thought, although I too was suffering from the long day in the sun without enough water, so I knew how Neville felt.

"it only dawned on me rather late that we were taking much longer to get airborne"

The canopy was closed, towline hooked up, and wing-walker in place to launch, and off we went. I was happily snapping away with my Nikon, getting some quite good photos of the initial take-off run etc., so it only dawned on me rather late that we were taking much longer to get airborne and climb away this time. The tow plane had become airborne, then settled back to the ground shortly afterwards, seemingly with a power problem. However, it struggled skywards again, and managed to clear the boundary fence by about three metres, all the time with us hanging on behind just above his level as we also struggled to remain airborne. Clearly, something was amiss, but we had no real options available to get us back to the runway, so we stayed hooked up.

Eventually, the poor old Tri Pacer gave up the race, and I have a great photo of its main undercarriage splayed out at a rather flat angle as it bounced off the road alongside the airport perimeter. At the same time, the tow rope went slack as the tow pilot released us to climb away and circle back for a landing. We had almost nowhere to go, so quickly, Neville decided the road was the only place where we could reasonably land from this height and speed. He stood the poor old Blanik on its left wing in a desperate effort to line up with the road. By this time, the speed had washed off, and of course, the steep turn only made it worse, so we came crashing down onto the road, essentially wings level, but VERY hard.

After a very short landing roll, we came to a stop and Neville and I unstrapped and climbed out to push the glider off the road and away from traffic. Fortunately, there were no cars on the road when we 'landed' and none came along for the next 15 to 20 minutes.

While we waited for a couple of club members to bring a vehicle over and tow us back to the airfield, Neville and I were busy trying to work out just what had gone so horribly wrong. Obviously the tow plane had trouble getting us airborne and climbing away, so our initial thoughts were that he had some kind of engine problem, but he'd managed to get back to the runway after a normal circuit, so perhaps that wasn't the problem after all? Then, I saw that our spoilers were extended fully and commented to Neville that in the short time available he had done well to get them out for landing, but wouldn't flaps have been more useful? His response—that he hadn't deployed the spoilers at all—made us realise … we now had the answer to the performance problem!

We discussed the spoilers for some time, but neither of us could remember seeing them extended before take off, so they must have been retracted, but the handle not properly latched. The take-off bumps and rattling had presumably moved the handle just enough to make the spoilers extend, and suddenly the tow plane had a much greater load to haul airborne. Given that it was a little marginal in power for towing the Blanik even under ideal conditions, the extended spoilers had caused enough drag to prevent climb. He had just enough power to get us to the scene of the accident …

A simple mistake to make, and one he wouldn't normally have made I'm certain, if Neville hadn't been pretty much in the seat for five hours and clearly fatigued. We shouldn't have flown that last sortie—only saving the small effort of towing the Blanik back to the hangar behind a car. Instead, we had bent metal. It could have been much more serious if there had been traffic on the road, or any one of a number of other things had gone just a little differently. We had been very lucky to survive with no injury to anything except pride. However, the Blanik didn't fly for the next few months, while it was repaired.

Since then, there have been many times when my work day has been extended, or I haven't had enough rest the night before, and I've had cause to reflect on the insidious nature of fatigue. We often don't realise that we are even becoming fatigued until it's too late. Flight and duty time limitations are in place for a very good reason, but we can still become fatigued while working within those limitations, so they are only a guide anyway. Certainly, I've become much more aware of my own levels of performance degradation with increasing fatigue. In my case, it seems to begin with my radio calls becoming more sloppy and poorly planned. My next symptom is a general lack of maths ability, when even simple calculations of time intervals, or fuel remaining, take more effort. Of course, others' symptoms may be different, so all I can recommend is you watch for the insidious signs of fatigue and try to spot if your performance is degraded. If it is, you need to shorten your day, or get some rest. Know your symptoms and don't fly fatigued.

Australian Government
Australian Transport Safety Bureau

Australia's national transport safety investigator

Martin Dolan
Chief Commissioner

Selling aviation safety

I recently spoke at the 2013 Safeskies conference in Canberra. Safeskies was a great opportunity to meet with people in the aviation industry and discuss the important safety issues facing Australian aviation.

As part of my speech, I talked about the overall state of safety in Australian aviation. Despite the recurring and often avoidable accidents we keep seeing in general aviation, our investigations and analysis of occurrence data indicate that there is no overall increase in risk or systemic safety issues in Australian aviation. Indeed, international benchmarking data shows that Australia is one of the safest places to travel in passenger aircraft in the world.

We have a proud record, but without good and consistent communication, this message will be lost in the noise of some alarmist headlines.

This may surprise some whose opinion is shaped by those who seek to sensationalise or overstate the dangers of some occurrences. For example, some of the predictable headlines following a loss of separation event—such as "Seconds from disaster"—don't fairly reflect the facts about what really happened.

Aviation safety is a complex thing to communicate. Because it relies on humans—be they flight crew or air traffic controllers—errors will inevitably occur. But we've seen time and again that when things do go wrong, the safety defences put in place to detect and prevent a significant accident have worked as intended.

This is a tough message to convey and I think we could all collectively do a better job at reassuring the public, without glossing over the need for continued improvement or the real dangers of complacency.

During my speech I encouraged industry to give an accurate account of the safety of Australian aviation. We have a proud record, but without good and consistent communication, this message will be lost in the noise of some alarmist headlines.

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Australia's national transport safety investigator

Research report reveals low aircraft separation risk

A new research report by the ATSB reveals that the vast majority of loss of aircraft separation occurrences in Australia present little or no risk of collision, but more can be done to improve safety.

The report, *Loss of separation between aircraft in Australian airspace January 2008 to June 2012*, shows that Australia has one of the lowest loss-of-separation occurrences rates, attributable to civilian air traffic control, in the world. A loss of separation (LOS) between aircraft under air traffic control happens on average once every 3 days. In almost 90 per cent of LOS occurrences there was no or a low risk of aircraft colliding. Australia has about six LOS occurrences each year that represent an elevated safety risk. However, a LOS does not normally indicate that there was a near-collision between aircraft. There have been no mid-air collisions in Australia involving aircraft being provided with a separation service by air traffic control.

The ATSB has issued safety recommendations to the Department of Defence and CASA to address the safety issues identified.

The report also reveals that half of all LOS occurrences are attributable to air traffic controller actions, while the other half results from pilot actions. The ATSB considers that more can be done to learn from LOS occurrences attributable to pilot actions in civil airspace.

The number of LOS occurrences under military control was found to be relatively high and most are the result of controller actions. The report finds that current regulatory arrangements do not enable CASA to give the same level of safety assurance for civilian aircraft under military control as it does for aircraft under civilian control. The ATSB has issued safety recommendations to the Department of Defence and CASA to address the safety issues identified in the report.

The release of this report coincided with the release of two other ATSB investigation reports in separate incidents (one near Ceduna, SA and the other about 900 km northwest of Karratha, WA) that involved losses of separation between passenger aircraft under air traffic control. As part of the Karratha investigation, the ATSB issued two safety recommendations to Airservices Australia. These recommendations were issued in response to the limited formal guidance available on the monitoring of newly endorsed controllers and the use of clearances that allow aircraft to operate anywhere between two flight levels, rather than at a single level.

READ MORE

A portrait of safety

The ATSB's latest research report focusses on aviation safety occurrences over the last ten years, identifying improvements and problems.

Every year, thousands of safety occurrences involving Australian-registered and foreign aircraft are reported to the ATSB by individuals and organisations in Australia's aviation industry, and by the public. The vast majority are minor, but there are serious incidents and accidents. Each notification is retained in the ATSB's databases, building up a detailed picture of Australian aviation.

The new ATSB report, *Aviation Occurrence Statistics 2003 to 2012*, gives that information back to pilots, operators, regulators, and other aviation industry participants. The report describes what accidents and incidents have happened, how often they are happening, and what we can learn from them.

In 2012, there were 107 accidents, 195 serious incidents, and over 7,300 incidents reported to the ATSB...

In 2012, there were 107 accidents, 195 serious incidents, and over 7,300 incidents reported to the ATSB involving Australian (VH– registered) aircraft, and a further 570 occurrences that involved foreign-registered aircraft operating within Australia or its airspace. A new addition to this report is data on 274 occurrences involving recreational (non–VH) aircraft safety.

These statistics provide an important reminder to everyone involved in the operation of aircraft that accidents, incidents, and injuries happen more often than is widely believed. Some of the most frequent accident types are preventable, particularly in general aviation.

Read the research report, AR-2013-067 on the ATSB website.

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Australia's national transport safety investigator

Visual flight at night accidents:

What you can't see can still hurt you.

The ATSB has released the latest in its Avoidable Accidents series of booklets. The new booklet is titled *Visual flight at night accidents: What you can't see can still hurt you*.

"This is an important issue that we're keen to address," said Stuart Godley, head of the ATSB's research section. "We've seen too many fatal accidents happen to Australian pilots who were taken unawares by the risks that come with flying at night. These often involve pilots flying under visual flight rules, but some also involve pilots flying under instrument flight rules."

On average, there have been nearly two accidents per year as a result of visual flight at night. Relative to the amount of flying, the night accident rate is at least 3 times higher than accidents in the day. To make matters worse, accidents at night are especially unforgiving. Of 36 such accidents between 1993 and 2012, 27 had fatal outcomes leading to 58 fatalities.

On average, there have been nearly two accidents per year as a result of visual flight at night.

"This booklet describes some of the key risks that pilots can face while flying at night, including operations in dark-night conditions, and perceptual illusions that can lead to spatial disorientation. Illusions can affect anyone, and leave any pilot vulnerable."

The new booklet, like the others in the series, outlines the dangers, provides strategies to deal with them, and uses a series of real accidents to show the real-world implications.

"We provide these booklets for free to anyone who wants them," said Godley. "They've proven to be a popular and valuable resource for all members of the aviation community, from students right through the most experienced of pilots."

The booklet is available for free download from the ATSB website. To request free hardcopies of the Avoidable Accidents series, contact the ATSB.

READ MORE

Spatial disorientation contributes to fatal helicopter accident

A fatal helicopter accident in the remote desert reveals the challenges and dangers of flying in dark night conditions.

On 18 August 2011, an Aérospatiale AS355F2 (Twin Squirrel) helicopter was being operated under the visual flight rules (VFR) east of Lake Eyre, South Australia. The pilot and two film crew members were travelling to various locations to film and gather information for a television documentary. They stopped at an island in the Cooper Creek inlet to meet and interview a tour group. At about 1900, they departed for a 30-minute flight to a station for a planned overnight stay. It was after last light and, although there was no low cloud or rain, it was a dark night. The moon had not yet risen.

A number of witnesses at the departure site saw the helicopter depart in an easterly direction before turning to the north. Several saw the helicopter descending and turning, followed by a fireball and an orange glow. After advising authorities of the situation, the tour group initiated a search, and at about 2040 they located the wreckage of the helicopter about 3 km east-north-east of the departure point. Tragically, the pilot and two passengers died in the accident. The ATSB investigation into the accident faced several challenges. Almost all of the airframe had been consumed by the fire, and the wreckage was spread across a trail of about 60 m. Neither a flight data recorder nor a cockpit voice recorder had been required, and so the helicopter was not fitted with either one.

As a result of this accident, the ATSB issued a recommendation to the Civil Aviation Safety Authority to prioritise its current efforts in making night flying safer.

The engines were removed from the accident site and taken to a Rolls-Royce M250-approved workshop for detailed examination under the supervision of the ATSB. From the evidence available at the examination, it was likely that at the time of the impact both engines were operating at a level of power, although the exact level could not be determined. An examination of the fuel components also identified no problems.

The helicopter's global positioning system (GPS) had been damaged, but some information was eventually retrieved, enabling ATSB investigators to project a track of the helicopter's progress. Based on the circumstances of the flight, they concluded that the pilot probably selected an incorrect

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destination on one or both of the helicopter's global positioning system units prior to departure.

The ATSB concluded that, after initiating the right turn at 1,500 ft, the pilot probably became spatially disoriented. As with most accidents, there were several factors that contributed. The pilot's orientation would have been affected by the dark night conditions, along with the high workload associated with establishing the helicopter in cruise flight and probably attempting to correct the fly-to point in a GPS unit. These factors would have combined with the fact that the helicopter was not equipped with an autopilot, and the pilot's limited recent night flying and instrument flying experience.

There are different levels of ratings for flying, and while the pilot had some experience flying at night, he did not hold an instrument rating and was therefore not rated to fly solely with reference to the flight instruments—he needed to have visual cues from outside the aircraft, such as landmarks or the horizon. In the dark night conditions of the accident, he would not have been able to see important points of reference.

CASA has advised that it will require helicopter air transport operations with passengers at night to use either a helicopter fitted with an autopilot or a two-pilot crew.

As a result of this accident, the ATSB has issued a recommendation to the Civil Aviation Safety Authority (CASA) to prioritise its current efforts in making night flying safer. These efforts include clarifying the requirements for night operations, providing enhanced guidance on night VFR flight planning, and providing enhanced guidance on other aspects of night VFR operations. In addition, CASA has advised that it will require helicopter air transport operations with passengers at night to use either a helicopter fitted with an autopilot or a two-pilot crew.

The ATSB advises all operators and pilots considering night flights under the VFR to assess the potential for the flight to encounter dark night conditions by reviewing weather conditions, celestial illumination and available terrain lighting. If there is a likelihood of dark night conditions, the flight should be conducted as an Instrument Flight Rules operation (capable of flying by reference to the instruments alone), or conducted by a pilot who has an IFR-equivalent level of instrument flying proficiency and in an aircraft that is equipped to a standard similar to that required under the IFR.

The full investigation report, AO-2011-102, is available on the ATSB website

READ MORE

Australia's voluntary confidential aviation reporting scheme

REPCON allows any person who has an aviation safety concern to report it to the ATSB confidentially. All personal information regarding any individual (either the reporter or any person referred to in the report) remains strictly confidential, unless permission is given by the subject of the information.

The goals of the scheme are to increase awareness of safety concerns and to encourage safety action by those best placed to respond.

How can I report to REPCON?
Online: www.atsb.gov.au/voluntary.aspx
Telephone: 1800 020 505
Email: repcon@atsb.gov.au
Mail: Freepost 600
PO Box 600, Civic Square ACT 2608

Timely reminder to check for icing

The reporter expressed a safety concern that on a November morning, the aircraft started the take-off run with ice on the wing. The ice melted before the aircraft rotated.

Response received from operator:

REPCON supplied the operator with the de-identified report. The following is a version of their response:

The information I have from Engineering is that this is likely Cold Soaked Fuel Frost or a Cold-Soak Effect. This had previously been known as non-environmental icing but the FAA requested the name change as it is important to note that this is not ice but frost that forms on the upper wing surface. Boeing have advised that many B737-600/-700/-800 operators have reported wing upper surface frost in ambient conditions of temperatures up to 20 degrees. The information from Boeing also shows that, because of the design of the wing, the frost usually occurs around the engine. The B737 Dispatch Deviation Guide has a procedure for the assessment of this frost and an allowance for dispatch under certain conditions.

We have checked the tech log and there is no report of any de-icing having been undertaken, although facilities do exist in this location. Additionally, there are no reports in our database from Flight Crew, Cabin Crew or Ground staff in relation to this. I also enquired if we had any CCTV footage, however, as part of the redevelopment of the airport, the airport authority has taken over control of the cameras and we do not have direct access, nor do we know if there are any cameras which may have captured this.

We would like to thank the reporter for bringing this occurrence to our attention. History has shown that passengers have or could have helped prevent occurrences so we take all reports from passengers seriously.

Response received from CASA

REPCON supplied CASA with the de-identified report and a version of response received from the operator. The following is CASA's response:

CASA has reviewed the REPCON and is satisfied with the operator's response.

ATSB Comment

The ATSB would like to remind operators of the dangers of icing on the aircraft's wings and the need to remain vigilant, even in warmer months, when there is a known icing danger. The temperature on this particular night did not go below 9 degrees Celsius.

LAME re-currency training

Report narrative:

The reporter expressed a safety concern regarding the operator's LAME re-currency training.

The reporter stated that the operator's training procedures specify that all LAMEs must receive continuation refresher training within 24 months and a maximum of 36 months after a training course has been attended. No LAMEs have received this training to date. This training has a delivery level of 3 which indicates that it has an impact on airworthiness.

The reporter also stated that the stores system is undermanned and consequently aircraft parts are received on a daily basis without the required paperwork, including the goods received number (GRN) or the serviceable label attached.

Response received from operator:

REPCON supplied the operator with the de-identified report. The following is a version of their response:

The Airline uses a combination of training delivery methods including class room, on the job learning, read & initial processes and tool box talks. All of these methods are used as outlined in the relevant Procedures Manual. There is no evidence available that airworthiness is in question due to a lack of training.

A review was conducted of the Airline's reporting database and stores rejection reports over the last 12 months. There were no safety or compliance issues identified which were consistent with the comments within the REPCON.

Response received from CASA:

REPCON supplied CASA with the de-identified report and a version of the operator's response. The following is a version of the response that CASA provided:

CASA is currently reviewing the mechanism that the operator has in place to verify maintenance persons working on the aircraft fleet. If there are any discrepancies identified in the conduct of training (which must be in accordance with CASA approved procedures), then CASA will take appropriate action.

In regard to stores system, CASA is satisfied that the operator has specific and comprehensive procedures to deal with receipt and despatch of aircraft components, and that the operator has reviewed and responded to the concerns appropriately.

How are REPCON reports processed?

REPCON staff will assess reports for clarity, completeness and significance for aviation safety and to ensure it meets the requirements of a Reportable Safety Concern (RSC) for aviation.

The report will be de-identified to remove all personal details of the reporter and any individual named in the report. This will be passed to the reporter who must authorise the content before the REPCON can proceed further.

The de-identified text is then forwarded to the relevant organisation that is best placed to address the RSC. The organisation's response will then be forwarded to the bodies such as CASA for further action as deemed necessary.

REPCON may use the de-identified version of the report to issue an information-brief or alert bulletin to a person or organisation, including CASA, which is in a position to take safety action in response to the safety concern.

How can I report to REPCON?
Online: www.atsb.gov.au/voluntary.aspx
Telephone: 1800 020 505
Email: repcon@atsb.gov.au
Mail: Freepost 600
PO Box 600, Civic Square ACT 2608

Airservices Australia's Class D Safety Forums

Jandakot 24-28 Feb 2014

Calling all GA pilots in Jandakot—mark the last week of February in your calendar. Airservices will host several safety forums in Jandakot that week featuring discussions on local incidents and investigations as well as presentations from tower approach and safety specialists.

Analysis by the Australian Transport Safety Bureau and Airservices internal reporting has highlighted concern of near collisions in the vicinity of both towered and non-towered aerodromes. Whether operating in class G or class D airspace, a good knowledge of the rules of the air, procedures and telephony assists in preventing this type of occurrence.

Airservices recognises it is often difficult for GA pilots to attend safety forums so there will be several sessions held each day during the week to allow as many pilots to attend as possible.

Designed to be thought-provoking and engaging, the safety forums will be catered and include gift voucher give-aways.

Airservices is keen to promote and foster a positive safety culture amongst the Australian aviation community. Come along with your peers and meet the controllers at the other end of the radio.

To book log on to trybooking.com and search for Airservices Jandakot safety forums.

Password to register is **safety**.

Changing from Ground frequency to report 'Ready' prior to the runway holding point

Airservices tower controllers are noting an increasing trend of pilots changing from Ground to Tower frequency and reporting 'Ready' well in advance of the holding point. Unless specified in ERSA or instructed to change frequency by air traffic control (ATC), changing frequency early can lead to situations where ATC are unable to contact an aircraft on the expected frequency, expecting it to be on Ground frequency when it has already transferred to Tower frequency. There is also the potential to cause avoidable congestion on the Tower frequency.

Calling 'Ready' early will not necessarily improve an aircraft's position in the departure sequence. The departure sequence is generally determined by ATC prior to aircraft calling 'Ready' and is formulated to maximise the efficiency of the runway and airspace configuration. Priority is determined by a range of factors including runway configuration, preceding landing aircraft, preceding aircraft cleared for take-off and the surrounding airspace available to the flight. The criteria used to determine priority are not always evident to pilots when making the 'Ready' call, however all attempts will be made to select a departure sequence that will most benefit all operators.

AIP ENR – 12 states that international aircraft will be instructed by ATC when to change to the Tower frequency prior to take-off. Domestic aircraft should change to Tower frequency when:

a. in the holding bay

b. close to, or at, the holding point of the nominated runway when ready for take-off.

Commencing descent for a visual approach

There seems to be some confusion as to the requirements for commencement of descent when ATC authorise a visual approach. A clearance for a visual approach is an approach clearance. During the conduct of a visual approach, the pilot is expected to descend as necessary to meet the minimum altitude requirements as specified in AIP ENR 12.8.5. The operative words are 'as necessary'. Pilots cleared for a visual approach are **NOT** expected to comply with the requirements of a change of level whereby the level change must be commenced as soon as possible, but not later than one minute after receiving the instruction.

International accidents/incidents 6 October – 10 November 2013

Date	**6 October**	**Description**
Aircraft	Saab 340B	The aircraft (first flight 1998) ran off the runway into the grass and the nose landing gear collapsed.
Location	Udon Thani Airport, Thailand	
Fatalities	0	
Damage	Substantial	
Date	**6 October**	**Description**
Aircraft	Pilatus BN-2A-8 Islander	Aircraft (first flight 1971) with a load of Sunday papers crashed at sea, killing its pilot.
Location	6.5km W of Cayo Luis Peña, Puerto Rico	
Fatalities	1	
Damage	Written off	
Date	**6 October**	**Description**
Aircraft	Antonov 2	The aircraft (first flight 1982) had been stored since 2000, then had repairs to make it airworthy. The engine lost power during a test flight and a forced landing was carried out, but the plane nosed over and was destroyed by fire. The plane had a false registration and was being flown without a CoA, so the Interstate Aviation Committee terminated its investigation.
Location	Sevryukova, Russia	
Fatalities	0	
Damage	Written off	
Date	**10 October**	**Description**
Aircraft	Antonov 2T	The aircraft (first flight 1969) crashed while attempting to land on a disused airstrip. A large quantity of Belarusian cigarettes was found in the wreckage. The plane had an old registration on its lower wing, but the registration on the fuselage was probably false because a plane with the same ID had crashed in February 2013.
Location	Skulyn, Volyns'ka region, Ukraine	
Fatalities	2	
Damage	Destroyed	
Date	**10 October**	**Description**
Aircraft	DHC-6 Twin Otter 310	During the landing phase, the MASwings aircraft (first flight 1988) sustained substantial damage when it struck the side of a house located 165m to the right of the runway centreline, killing the co-pilot and one passenger, and injuring four other passengers. A woman and her son, who were in the house, escaped unhurt.
Location	Kudat Airport, Malaysia	
Fatalities	2	
Damage	Destroyed	
Date	**14 October**	**Description**
Aircraft	Cessna 208B Grand Caravan	The AereoServicio Guerrero domestic passenger flight (first flight 2002) crashed after losing contact with ATC and was destroyed, killing all on board. The wreckage of the plane was found in mountain ranges two days later.
Location	26km W of Loreto Airport, Mexico	
Fatalities	14	
Damage	Destroyed	
Date	**16 October**	**Description**
Aircraft	ATR-72-212A	After aborting the initial approach the crew initiated a go-around before crashing into the Mekong River, killing all 49 on board. The weather in the area was poor due to a passing typhoon. (First flight March 2013)
Location	Mekong River, 8km NW of Pakse Airport, Laos	
Fatalities	49	
Damage	Destroyed	
Date	**18 October**	**Description**
Aircraft	Cessna 500 Citation 1	Corporate jet (first flight 1975) destroyed when it crashed, killing both on board. Unsuccessful attempts had been made to contact the aircraft shortly after takeoff. Several other turbine aircraft reported icing conditions at the time.
Location	3km SE of Derby, Kansas, USA	
Fatalities	2	
Damage	Destroyed	
Date	**19 October**	**Description**
Aircraft	ATR-42-320F	Cargo plane (first flight 1988) substantially damaged in a runway excursion. When the captain rotated during the take-off run the nosewheel did not lift off the ground, and he reported that the controls felt heavy in pitch. He aborted the take off and the aircraft ran over a bank at the end of the runway. The right wing hit the airport perimeter fencing and the right outboard wing and engine caught fire. The aircraft came to rest in a small creek, with most of the cockpit under water. The crew of three escaped though the hatch in the roof and were rescued by locals. The right engine fell off the wing into the water.
Location	Madang Airport, PNG	
Fatalities	0	
Damage	Written off	
Date	**23 October**	**Description**
Aircraft	Beech 1900C	Aircraft (first flight 1990) damaged when the landing gear collapsed after landing. Two passengers suffered minor injuries.
Location	Homer Airport, Alaska, USA	
Fatalities	0	
Damage	Substantial	
Date	**25 October**	**Description**
Aircraft	Fokker F-27 500F	Cargo plane (first flight 1968) damaged when the left-hand engine suffered an uncontained failure and the propeller blades sliced through the fuselage of the aircraft and came out at the other side. A safe emergency landing was carried out at Paris CDG.
Location	Charles de Gaulle Airport, Paris, France	
Fatalities	0	
Damage	Substantial	
Date	**26 October**	**Description**
Aircraft	Antonov 2	Aircraft (first flight unknown) destroyed by post-impact fire after hitting trees on the third attempt to land on an abandoned and unlit airstrip. Two of the four occupants were killed and the other two were injured. The aircraft was apparently unregistered and was on an illegal flight carrying two geologists.
Location	Tayozhny, Krasnoyarsk, Russia	
Fatalities	2	
Damage	Written off	
Date	**3 November**	**Description**
Aircraft	BN-2B-21 Islander	During a search and rescue mission, the aircraft (first flight 1982) experienced a complete loss of engine power and force landed in a field, causing substantial damage.
Location	Saint Mary, Jersey	
Fatalities	0	
Damage	Substantial	

International accidents
Compiled from information supplied by the Aviation Safety Network (see **www.aviation-safety.net/database/**) and reproduced with permission. While every effort is made to ensure accuracy, neither the Aviation Safety Network nor *Flight Safety Australia* make any representations about its accuracy, as information is based on preliminary reports only. For further information refer to final reports of the relevant official aircraft accident investigation organisation. Information on injuries is not always available.

Date	4 November	Description
Aircraft	Hawker Siddeley DH-125-400A	Jet (first flight 1969) shot down by a Venezuelan Air Force fighter plane after illegally entering Venezuelan air space. The number and fate of its occupants are unknown.
Location	13km N of Buena Vista del Meta, Venezuela	
Fatalities	N/A	
Damage	Written off	

Date	10 November	Description
Aircraft	Swearingen SA 227-AC Metro III	Aircraft (first flight 1991) crashed on approach to the runway in light snow and erupted in flames. Five of the seven people on board were killed. The aircraft had apparently been involved in 'several previous incidents', including a 1999 runway overrun which caused substantial damage.
Location	Red Lake Airport, Ontario, Canada	
Fatalities	5	
Damage	Written off	

Australian accidents/incidents 1 October – 15 November 2013

Date	1 October	Description
Aircraft	Piper PA-28-161	During cruise, the crew reported engine power loss and the pilot made a forced landing at night into a paddock. Aircraft substantially damaged and both occupants injured. Investigation continuing.
Location	Cunnamulla Aerodrome, N M 9km, QLD	
Fatalities	Minor	
Damage	Substantial	

Date	5 October	Description
Aircraft	Amateur-built KR-2	Aircraft crashed shortly after take off. Pilot killed. Investigation continuing.
Location	Tumut Aerodrome, 270° M 14km, NSW	
Fatalities	Fatal	
Damage	Destroyed	

Date	11 October	Description
Aircraft	Grob-Burkhart Flugzeugbau G-115C2	During landing, the aircraft bounced, re-contacted the runway heavily, and the nose landing gear collapsed. Pilot uninjured. Investigation continuing.
Location	Merredin (ALA), WA	
Fatalities	Nil	
Damage	Substantial	

Date	15 October	Description
Aircraft	Air Tractor AT-502	Aircraft struck powerlines during agricultural operations. The pilot made a forced landing in a nearby paddock. Investigation continuing.
Location	near Temora Aerodrome, NSW	
Fatalities	Nil	
Damage	Substantial	

Date	15 October	Description
Aircraft	Robinson R44	After landing in long grass, the crew saw a grass fire near the helicopter's exhaust outlet. The helicopter was subsequently consumed by fire and destroyed. Investigation continuing.
Location	Daly Waters (ALA), N M 33km, NT	
Fatalities	Nil	
Damage	Destroyed	

Date	16 October	Description
Aircraft	Amateur-built S-7 Courier	After departure, the propeller delaminated, resulting in airframe vibrations. The pilot shut down the engine and made a forced landing on a disused agricultural strip. Aircraft overran the runway strip into a canola field and flipped, resulting in substantial damage.
Location	Forbes Aerodrome, 86.74° M 29km, NSW	
Fatalities	Nil	
Damage	Substantial	

Date	18 October	Description
Aircraft	Ayres S2R	During agricultural operations, the aircraft crashed and the pilot was killed. Investigation continuing.
Location	Forrestania Aerodrome, 267° M 85km, WA	
Fatalities	Fatal	
Damage	Substantial	

Date	20 October	Description
Aircraft	de Havilland DH-82A	During the take-off run, the aircraft's nose dropped rapidly and it flipped over. Engineering inspection found rust in the left brake and a sticky brake actuator. Investigation continuing.
Location	Coffs Harbour Aerodrome, 023° M 19km, NSW	
Fatalities	Nil	
Damage	Substantial	

Date	23 October	Description
Aircraft	Beech 95-B55	During take off, the front entry door opened and the aircraft returned to St Helens, where it landed wheels up, resulting in substantial damage. Investigation continuing.
Location	St Helens Aerodrome, TAS	
Fatalities	Nil	
Damage	Substantial	

Date	21 October	Description
Aircraft	Air Tractor AT-502B	During landing, the aircraft veered off the runway and ground looped. The left leg fell off the aircraft and the left wing and propeller hit the ground, resulting in substantial damage. Investigation continuing.
Location	Deniliquin Aerodrome, 038° T 20km, NSW	
Fatalities	Nil	
Damage	Substantial	

Date	23 October	Description
Aircraft	Cessna 182Q	The aircraft collided with terrain, killing the pilot. Investigation continuing.
Location	Mount Hotham Aerodrome, 201° M 15km, VIC	
Fatalities	Fatal	
Damage	Substantial	

Date	24 October	Description
Aircraft	PZL Warszawa-Okecie M-18A	The ATSB is investigating the fatal accident involving a Dromader aircraft near Ulladulla, NSW on 24 October 2013. The aircraft was being used in aerial firefighting operations when it crashed, killing the pilot.
Location	Ulladulla (VFR), 271° T 37km, NSW	
Fatalities	Fatal	
Damage	Destroyed	

Date	25 October	Description
Aircraft	Amateur-built Lancair Legacy	Aircraft crashed, killing both occupants. Investigation continuing.
Location	Shepparton Aerodrome, NSW	
Fatalities	Fatal	
Damage	Substantial	

Date	30 October	Description
Aircraft	Piper PA-34-200T	During landing, the nose landing gear and left landing gear collapsed. Aircraft sustained substantial damage.
Location	Manjimup Aerodrome, WA	
Fatalities	Nil	
Damage	Substantial	

Date	31 October	Description
Aircraft	Cessna 172N	During landing, the aircraft encountered a wind gust and struck a tree. Investigation continuing.
Location	Edinburgh Aerodrome, 010° M 94km, SA	
Fatalities	Nil	
Damage	Substantial	

Date	2 November	Description
Aircraft	Robinson R22 Beta	During landing, the engine lost power and the helicopter landed heavily on an embankment resulting in substantial damage.
Location	Essendon Aerodrome, 73° T 22km, VIC	
Fatalities	Nil	
Damage	Substantial	

Date	2 November	Description
Aircraft	Bell 206L-1	During take off, the helicopter crashed and was substantially damaged. Pilot received minor injuries. Investigation continuing.
Location	near Melbourne Aerodrome, VIC	
Fatalities	Minor	
Damage	Substantial	

Date	2 November	Description
Aircraft	Piper PA-31	During approach, the pilot received unsafe landing gear indications and diverted to Adelaide, where a fly-by was conducted. Ground observers reported that the landing gear appeared to be down, but on landing, the right main landing gear collapsed, resulting in substantial damage. Engineering inspection revealed that the actuator-down-limiting stop had been incorrectly adjusted.
Location	Adelaide Aerodrome, SA	
Fatalities	Nil	
Damage	Substantial	

Date	6 November	Description
Aircraft	Robinson R44 II	During landing, the helicopter rolled down an embankment and was substantially damaged. Investigation continuing.
Location	Mount Buller (HLS), VIC	
Fatalities	Nil	
Damage	Substantial	

Date	10 November	Description
Aircraft	Cessna 152 and Jabiru J160	Cessna 152 on approach collided with a departing Jabiru J160. The J160 made a hard landing and sustained serious damage. The C152 conducted a go-around before making a normal landing. Investigation continuing.
Location	Tyabb (ALA), VIC	
Fatalities	Nil	
Damage	Minor	

Date	12 November	Description
Aircraft	Bell 206B (III)	During cruise, the drive shaft failed and the crew made a forced landing. The tail boom was severed during the auto-rotation. The investigation is continuing.
Location	Finke (ALA), 040° M 111km (S24 56 50 E 135 09 35), NT	
Fatalities	Nil	
Damage	Substantial	

Date	12 November	Description
Aircraft	Beech A36	During a touch-and-go landing, the student pilot misidentified the flap lever and inadvertently retracted the landing gear. The instructor attempted to correct, but the nose landing gear and right main landing gear retracted, and the aircraft veered off the runway to the right.
Location	Camden Aerodrome, NSW	
Fatalities	Nil	
Damage	Substantial	

Date	13 November	Description
Aircraft	Robinson R22	During aerial mustering operations, the engine failed and the pilot made a forced landing. The helicopter landed hard and was substantially damaged.
Location	Donors Hill (ALA), 164° T 25km (Donors Hill Station), QLD	
Fatalities	Nil	
Damage	Substantial	

Date	15 November	Description
Aircraft	Pitts S-1E	During landing, the aircraft ground looped, resulting in substantial damage.
Location	Mareeba Aerodrome, QLD	
Fatalities	Nil	
Damage	Substantial	

Australian accidents
Compiled by the Australian Transport Safety Bureau (ATSB). Disclaimer – information on accidents is the result of a cooperative effort between the ATSB and the Australian aviation industry. Data quality and consistency depend on the efforts of industry where no follow-up action is undertaken by the ATSB. The ATSB accepts no liability for any loss or damage suffered by any person or corporation resulting from the use of these data. Please note that descriptions are based on preliminary reports, and should not be interpreted as findings by the ATSB. The data do not include sports aviation accidents.

FLIGHT BYTES

Truss sets ETA on safety review

The Federal Government is conducting an independent review of aviation safety regulation in Australia.

'This announcement delivers on one of the key commitments outlined in the Coalition's 2013 Policy for Aviation,' Deputy Prime Minister and Minister for Infrastructure and Regional Development Warren Truss said.

The review by a panel of aviation safety experts will benchmark Australia's safety regulation against other leading countries.

'Australia has an enviable record in aviation safety – among the best in the world – which has been built on a strong regulatory system, forged over many years,' Mr Truss said.

Mr Truss said aviation activity was expected to double in the next twenty years and said the independent review reinforced the Government's commitment to maintaining safety as the highest priority in aviation.

David Forsyth AM, will chair the review panel. Mr Forsyth is the chair of Safeskies Australia and former chair of Airservices Australia. The other members of the panel are Don Spruston, former director general of civil aviation at Transport Canada, and Roger Whitefield, former head of safety at British Airways, former safety and adviser to Qantas.

Phillip Reiss, president of the Aircraft Owners and Pilots Association—Australia, has also been appointed with particular responsibility to ensure that the concerns of general aviation and regional operators are well aired.

The review panel will report to Mr Truss in May 2014.

No safety audit on Lao Airlines

Sky News reports that the airline operating the ATR-72 turboprop that crashed into the Mekong River in southern Laos, killing all those on board, including an Australian family, had not undergone the airline industry's most widely recognised safety audit.

The Australian victims are from two families—a tax consultant from Sydney, his wife and their son and daughter, as well as an aid worker and his son.

Geoffrey Thomas, from airlineratings.com, said he rated Lao Airlines as a 'four out of seven star airline' because it hadn't participated in an international safety audit. 'The major problem with the airline is that it has not taken part in an operational and safety audit conducted by the International Air Transport Association (IATA)', he told Melbourne radio station 3AW. 'To join IATA, which is the main body in aviation today, you have to actually pass this.'

He said airlines that had passed the audit had a 4.3 times better safety record than airlines that have not.

'So it's a major audit of the airline's whole systems top to tail,' Mr Thomas added.

Read more at *Sky News:* www.skynews.com.au/national/article.aspx?id=915855&vId=4193380

The dizzy heights of tourism

A new space tourism company has unveiled plans to take passengers into the stratosphere by 2015. However, unlike many of the much-publicised attempts by the likes of Virgin Galactic and XCOR Aerospace, who are planning to use rocket-propelled fixed-wing aircraft, World View plan to do it with a giant balloon. Tickets are $US75,000 (drinks included), which may appear a bit lofty, but seems relatively cheap in comparison to Virgin Galactic's $US250,000 per passenger.

'This is a very gentle flight that will last for hours aloft', said Jane Poynter, World View's chief executive. She said the cabin would be about the size as that of a private jet, and would have a 'superbly comfortable, luxurious interior where you can get up and stand upright and move around and go back to the bar and get a drink'.

With six passengers and two crew members the trip will take about an hour and a half to reach altitude and then drift for a couple of hours before the balloon is jettisoned and the capsule glides back to Earth beneath a parasail. 'We really think there is a market for being able to contemplate the view', said Taber MacCallum, the company's chief technology officer.

Worldview's website describes the experience in appropriately soaring prose:

'Majestic views of our planet, slowly expanding below, are certain to captivate you, as you ascend to the edge of space. The transition from horizon to the blackness of space will thrill you. The luxurious comfort and gentle glide of your vessel will spoil you for hours, while you sip your beverage of choice. The curvature of the Earth will simply take your breath away. A truly transformative human experience.'

The principal shortcoming: you won't actually go into space, nor would you be able to call yourself an astronaut afterward. The balloon would rise about 30 km, not quite a third of the way to the 100 km altitude where the Karman line is considered to define the beginning of space. But 30 km is high enough to view the planet's curvature and for the sky to darken from blue to black. Even though the World View capsule will not reach space, the Federal Aviation Administration (FAA) will regulate it as a commercial space venture, because the capsule is built to provide a 'shirt sleeves environment' in space-like conditions.

World View's application to the FAA noted that at an altitude of 30 km, water and blood boil at a much lower temperature and decompression would be fatal.

"The FAA will not address the more difficult question of whether (the) proposed altitude of 30 kilometres constitutes outer space,' the agency noted drily in its official correspondence.

How safe is your heliport?

US consultancy HeliExperts International LLC unveiled a new 'Heliport Risk and Liability Assessment Toolkit' to the rotary wing community at the 2013 Air Medical Transport Conference. The heliport risk assessment program is centered around 15 specific categories based on regulations and guidelines, from the FAA, other US government agencies and industry best practices.

The assessment tool is designed to help heliport owners and helicopter operators identify potential operational risks and calculate the overall risk and liability exposure they represent, both individually and collectively. Once identified, risks can be appropriately mitigated through removal, updates, modifications or the implementation of operational limitations.

The principal author and architect of the heliport assessment toolkit, Rex Alexander, has worked in collaboration with government, commercial and private agencies, organisations and individuals over the past four years in the development and field testing of this safety management tool. 'We identified a void in the rotary wing community from a risk analysis and safety management perspective as it pertained to rotary wing infrastructure and set out to develop an educational product that anyone could use and would be free to everyone,' he says.

Read more at: www.aviationpros.com/press_release/11193480/heliport-risk-and-liability-assessment-toolkit

CASA warns bushfire 'drone' operators of potential fines

CASA is warning that anyone caught flying unapproved drones over fire-affected areas could be fined.

It says there were two incidents during the October 2013 bushfires of people operating remotely piloted aircraft (RPA) over fires in Lithgow and the Blue Mountains.

CASA says the RPA flights had put firefighting responses at risk.

Footage of a remotely piloted aircraft being operated in the area of the State Mine fire near Lithgow, as firefighters battled to control the blaze, was posted on YouTube.

The footage shows the drone being flown above firefighters and the nearby fire, as well as into a burnt-out building.

It appears to have breached civil aviation safety regulations.

It adds that flying a remotely piloted aircraft in the same airspace as helicopters and planes fighting fires creates a real risk of a mid-air collision.

Director of Aviation Safety, John McCormick, says the unapproved use of remotely piloted aircraft during a bushfire was irresponsible.

'People who have a drone must fly according to the civil aviation regulations and they must use their common sense', he said.

'Flying an unapproved remotely piloted aircraft near firefighting aircraft, firefighters and firefighting vehicles is dangerous.'

Civil aviation safety regulations state remotely piloted aircraft must be kept 30 metres from people, unless otherwise approved.

CASA reminds RPA and model aircraft enthusiasts that it is an offence to operate a remotely piloted aircraft in controlled or restricted airspace without approval, or to operate in a way that creates a hazard to another aircraft, person or property.

CASA says the RPA operating near bushfires are an unnecessary hazard that could force firefighting aircraft to land.

'If they stop for half an hour or an hour, the bushfire will continue to burn and could put properties and lives at extra risk', spokesman Peter Gibson said.

'If we get evidence of drones being used in an unsafe manner, we certainly will issue fines and ... the fines can be many thousands of dollars.'

Emergency blow-out at Sydney airport

Sydney airport saw a substantial emergency on 20 October last year when a United Airlines Flight 840, a Boeing 747 747-400, was forced to dump fuel and land after blowing several tyres on take-off, causing major delays to other flights that day. The aircraft dumped fuel to reduce landing weight and landed one hour after take-off.

Photos obtained by www.AirlineRatings.com show several tyres were shredded.

Read more at *AirlineRatings.com*: www.airlineratings.com/news/141/united-airlines-emergency-at-sydney

Challenge to improve incident reporting

The Australian Transport Safety Bureau (ATSB) is keen to boost incident reporting by general aviation after a report indicated a low awareness among GA personnel about the need to report safety matters.

A recent ATSB report showed there were 107 accidents, 195 serious incidents and more than 7300 reported incidents last year involving Australian-registered aircraft.

But the ATSB estimates up to 30 per cent of all safety incidents in Australia each year go unreported.

General aviation still makes up about 90 per cent of the VH-registry and the Bureau calculates it accounts for about half of all aircraft movements across Australia and about 40 per cent of total hours flown by Australian aircraft. 'Despite the greater size of general aviation compared to air transport in both fleet and departure numbers, comparatively few occurrence reports are sent to the ATSB involving general aviation aircraft, the ATSB report said.

Free HF seminar

On 17 February 2014, the University of the Sunshine Coast is hosting a free seminar on human factors (HF) and safety science. The seminar will be of interest to anyone working in transport safety, accident analysis and prevention, as well as human factors and ergonomics generally.

Presentations from leading international human factors researchers will focus on the latest HF research and practice in aviation, road, rail and workplace safety.

RSVP: FABResearch@usc.edu.au by Monday 10 February 2014

New online aviation resource helps travellers and public

A new online aviation information resource centre has been set up to help people with questions or issues relating to Australian air travel and aviation operations.

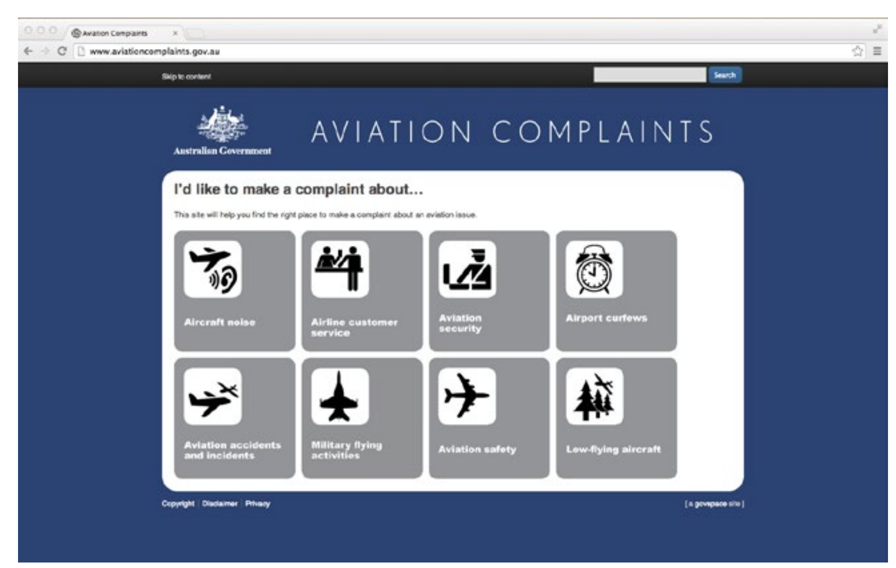
The resource centre covers eight areas of aviation operations of most interest to air travellers and the general public These are:

- Aircraft noise
- Airline customer service
- Aviation security
- Airport curfews
- Aviation accidents and incidents
- Military flying activities
- Aviation safety
- Low-flying aircraft

Each area has a dedicated web page which provides a snapshot of the relevant issues, explains where to get additional information, and sets out how to lodge an enquiry or complaint.

The aviation information resource centre streamlines the process of lodging and responding to enquiries or complaints.

The agencies involved are the federal Department of Infrastructure and Regional Development, the Australian Defence Force, Airservices Australia, the Civil Aviation Safety Authority, the Australian Transport Safety Bureau and the Aircraft Noise Ombudsman. To visit the new website, click here.



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If you have an aviation reference number (ARN) and want to update your contact details, go to www.casa.gov.au/change
For address change enquiries, call CASA on 1300 737 032

DISTRIBUTION
Bi-monthly to aviation licence holders, cabin crew and industry personnel in Australia and internationally.

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AvSafety seminar
www.casa.gov.au/avsafety

AvSafety seminars

CASA holds AvSafety seminars around Australia to target key safety issues and to inform industry about regulatory reform. The seminars also showcase the interactive programs available online to help you keep safe in the air and on the ground. Your local aviation safety advisor will take you through *Out-n-back*, *OnTrack*, and other CASA educational resources.

There will be opportunities for shared discussions on operator and individual obligations, as well as to ask questions and raise issues relating to regulatory change.

Aero clubs and other aviation organisations are also welcome to run additional aviation safety seminars with ASAs presenting. However, CASA will not be financially supporting these events beyond reasonable operating costs.

To register for one of these seminars, go to **www.casa.gov.au/avsafety**
Please note the schedule can change, so go online to **www.casa.gov.au/avsafety** to check for updates.

- CASA events
- Other organisations' events

To have your event listed here, email the details to **fsa@casa.gov.au** Copy is subject to editing.

ACT/NEW SOUTH WALES

Bathurst	AvSafety	5 February
Albury	AvSafety	6 February
Forbes	AvSafety	1 February
Temora	AvSafety	13 February
Nowra	AvSafety	27 February
Griffith	AvSafety	5 March
Wagga	AvSafety	6 March
Newcastle	AvSafety	18 March
Port Macquarie	AvSafety	18 March
Broken Hill	AvSafety	19 March
Coffs Harbour	AvSafety	20 March
Deniliquin	AvSafety	25 March
Merimbula	AvSafety	26 March
Moruya	AvSafety	27 March

QUEENSLAND

Goondoowindi	AvSafety	5 February
Maroochydore	AvSafety	20 February
Rockhampton	AvSafety	25 February
Mt Isa	AvSafety	11 March
Townsville	AvSafety	25 March

NORTHERN TERRITORY

Jabiru	AvSafety	4 March
Katherine	AvSafety	5 March

VICTORIA

Yarrawonga	AvSafety	4 February
Bendigo	AvSafety	27 February
Point Cook	AvSafety	20 March
Warracknabeal	AvSafety	27 March

SOUTH AUSTRALIA

Port Augusta		4 February
Port Lincoln	AvSafety	5 February
Gawler	AvSafety	12 February

WESTERN AUSTRALIA

Bunbury	AvSafety	5 February
Albany	AvSafety	19 February
Esperance	AvSafety	21 February
Broome	AvSafety	20 March

AV**SAFETY**
aviation safety advisors

For more information about CASA's aviation safety advisors (ASAs), and to find out who your local ASA is, go to **www.casa.gov.au/avsafetyadvisors**

INTERNATIONAL

3–4 February
Second Annual Aviation Safety Culture Summit
Dubai | UAE
www.aviationsafety.ae

14 February
Expressions of interest in submitting papers open for International Society of Air Safety Investigators 45th annual seminar, to be held 13–16 October
Adelaide, South Australia
www.isasi.org

19–20 February
European Business Aviation Safety Conference (EBASCON 2014)
Munich, Germany
www.ebascon.eu/

26–27 March
Safety in Aviation Asia 2014
Singapore
www.aviationsafetyconferences.com

16–17 April
59th annual Business Aviation Safety Summit (BASS) 2014
San Diego, USA
flightsafety.org/aviation-safety-seminars

21–22 May
Asia Pacific Aviation Safety Seminar (APASS 2014)
Bangkok, Thailand
www.aapairlines.org

UPCOMING EVENTS

17 February 10.30am – 3pm
Human Factors and Safety Science seminar
University of the Sunshine Coast, Innovation Centre. RSVP: FABResearch@usc.edu.au by Monday 10 February

24–28 February
Airservices Australia's Class D safety forums
Jandakot, Western Australia

PRODUCT REVIEW

OUT NOW

Ramp check leaflet

If you are a general aviation pilot and you've been selected by a CASA inspector for a ramp check there's probably one thought foremost in your mind:

What happens now?

A new CASA leaflet answers this question in clear simple language. It also explains why the ramp check—an inspection of an aircraft and its pilot, for proper documentation and procedures—should be nothing to fear for the well-prepared pilot.

You can order copies of the leaflet from CASA's online store **www.casa.gov.au/onlinestore**

Or view it online and download it from **www.casa.gov.au/pilotguides**

NEXT ISSUE

March – April 2014

- Regular public astronauts: counting down to the age of consumer spaceflight
- Up, down, turn around: the fundamental hazard of spatial disorientation
- Saturation point: How a tropical downpour brought down an airliner
- … and more close calls

Australian Government
Civil Aviation Safety Authority

OUT NOW!

SAFETY BEHAVIOURS: Human Factors for Engineers resource kit

CASA has released the *Safety Behaviours: Human Factors for Engineers* resource kit with aircraft maintenance engineers and small to medium-sized maintenance organisations in mind. However, larger organisations may find it a useful supplement to existing human factors programs, or a basis on which to build an appropriate program.

The kit consists of:

- *Resource guide for engineers*
- *Workbook for engineers*
- *Facilitator's guide*
- A DVD featuring a drama, *Crossed Wires*, portraying a fictitious maintenance organisation; *Right Connection* and 'What the experts say', a series of 12 interviews with HF specialists.
- CD-ROM of resources

You can download the various sections of the kit from www.casa.gov.au/hf or hard copies are available from CASA's online store: www.casa.gov.au/onlinestore flightsafety

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