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POINTING TO SAFER AVIATION

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# The Problem with Women in Aviation…

## Part 61 *Pilot Licences and Ratings* Changes

## Aircraft Data Plates

## Flying Under the Roof of the World

CAA
CIVIL AVIATION AUTHORITY OF NEW ZEALAND
Te Mana Rererangi Tūmatanui o Aotearoa

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Cover: CAA engineers Beth Coughlan (left) and Andrea Wadsworth took part in last year's global #iLookLikeAnEngineer campaign which aimed to raise awareness that women engineers could be women, and engineers. See page 3.


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# The Problem with **Women in Aviation...**

Evidence indicates that women aviation workers are just as safe as men. So what is holding women back from making aviation a career? Finding the answer to that question is vital because there's a looming global crisis in pilot and engineer numbers.

It's impossible to write about the lack of women pilots and engineers in New Zealand's aviation community without also considering still-held perceptions about women's ability to be safe in the air, or to ensure others are.

To test the breadth of such opinions, CAA safety promotion staff conducted a 'straw poll' of 30 members of the public.

Four respondents said they didn't think they had ever flown with a woman airline captain.

Three said it was no longer a surprise to hear a woman making the captain's introductory announcement, and her ability to fly safely was not a concern to them.

Of the 23 who said a woman captain had been a surprise to them, 20 were unworried about safety. "She wouldn't be up the front, if she couldn't do the job."

So the issue of how able women pilots are, doesn't seem to exist to any large degree, in the minds of the public.

## The Evidence

Research is also unsupportive of any disquiet over the ability of women fliers to be safe.

An American study[1] in 1986, of National Transportation Safety Board data, found male pilots were 60 per cent more likely to have an accident than women pilots, and male pilots were twice as likely to have fatal accidents.

A decade later, a study[2] of American pilots found that when adjusted for age and experience, men and women commercial pilots had about the same accident rates.

American research in 2000[3] found that while there were real physiological differences between men and women aviators, the advantages and disadvantages of those differences affected both sexes. For instance, it found women had faster reaction times, seen as vital in an emergency. But other research in 1989 found men had superior visual spatial ability, needed to operate in a three-dimensional environment, such as flying[4].

1 *Pilot-error accidents: male vs female.* Vail G and Ekman L, St Mary's University of Minnesota, 1986, in *Aircrew Co-ordination and Communication*, 2006.

2 *Comparing Pilot-error Accident Rates of Male and Female Airline Pilots.* Mcfadden K, Northern Illinois University, 1996.

3 *Gender Differences in an Aviation Physiology Environment.* Howell C, Embry-Riddle Aeronautical University, 2000.

4 *Sex Differences in Cognitive Abilities* (1st ed.) Halpern D, Claremont McKenna College, California, 1989.

Even at the pointy end of flying – combat – research indicates that women fliers are at least as safe as men, if not more so.

A study[5] in 2014 found that, while 10 per cent of US army helicopter pilots are women, they figure in three per cent of accidents.

So, if the safety of women in aviation is not the issue, why do so few of them participate in the sector?

The combat study's author, Major Seneca Peña-Collazo, an AH-64 Apache helicopter-gunship pilot, says the real problem is the culture.

Photo courtesy of Tracy Lamb.

Tracy Lamb, former Virgin Australia senior first officer: "There's no evidence to suggest that female and male pilots are any different in terms of safety levels."

5 *Women in Combat Arms: A Study of the Global War on Terror.* Peña-Collazo S, US Army Command and General Staff College, 2014.

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"It is a culture that presupposes women's physical inferiority and lack of psychological and emotional coping mechanisms. It is a culture that values hypermasculinity and is resistant to change anything that would challenge long-standing traditions."

Australian researchers[6] surveyed about 1100 pilots, including about 270 women. Despite female pilots earning significantly higher scores than their male counterparts on actual performance measures, both sexes had significantly more negative perceptions of female pilots' proficiency and safety orientation.

## The Numbers

In 1998, in New Zealand, the proportion of women commercial pilots was an average 4.6 per cent of all CPL and ATPL aeroplane and helicopter pilots. In the 18 years since, there's been a sluggish increase to 6 per cent.

Latest figures, however, do show that in New Zealand, 9.45 per cent of all CPLs and ATPLs under the age of 38 are women.

So the rate of women becoming pilots is increasing.

But slowly. And that's a problem because, according to a study by Boeing[7], there's soon to be a chronic, worldwide shortage of pilots.

The 2014 research found there'll be a 558,000 shortfall of pilots over the next two decades.

The demand in the Asia-Pacific region represents 40 per cent of those numbers – the highest need in the world.

But it's not just about the number of women needed to help fill that gap.

## The Qualities

Peter Stockwell, from Hamilton's CTC Aviation – who in 2014 made a public call for more women to make aviation their career – believes that the industry is also missing out on the particular skills they bring to flying.

"Generally speaking," says Peter, "I believe they perform better than men in a cockpit environment, where close cooperation is best practice.

"I think women, generally, are less aggressive, less confrontational, and better able to communicate in effective ways."

A CTC flight instructor, Emma-Jane Lacy, agrees with 2011 Austrian research[8] into glass cockpit behaviour, that pointed to women having better situational awareness than men.

"The women I've taught seem to have an ability to build an excellent mental picture of their surroundings – key to flight safety," Emma-Jane says.

Tracy Lamb, Global RPAS Safety Manager with aviation advisory company, SGS – and formerly a Virgin Australia senior first officer – says multiple studies indicate women's management styles, and their ability to multi-task, also add value to airliner safety.

"There's no evidence to suggest that female and male pilots are any different in terms of safety levels," she says.


In July 2015, the image of San Francisco software engineer, Isis Anchalee, was used in a tech recruitment poster campaign. The world of social media exploded with comments about her appearance, many doubting she could be an engineer and look the way she did. That led to a global social media image campaign where women engineers were photographed with placards describing what they did. The CAA's two women engineers, Beth Coughlan (left) and Andrea Wadsworth took part.

A three-year British study[9] of 7500 people in 40 countries also confirms what many people have 'known all along'. Women are less likely to take risks than men.

According to the authors, "women are more than twice as likely to be shrewd and vigilant about risk than men.

"Wary risk types help to counterbalance adventurous types," the authors say, "as they tend to be vigilant, extremely organised, and demand high standards."

Bearing that out is the recollection of former CAA Investigating Officer, fixed wing and rotary pilot, and flight instructor, Cathy Penney. She recounts that she and her former husband, Ted, used to fly a couple to the races at Wairoa in Hawke's Bay, during the 1970s.

When they later became friends, the couple told her that the difference between the pair was that Ted, if he got himself into difficulty, was a good enough pilot to get himself out of it again. Cathy, they said, would never have got into difficulty in the first place.

The culture that regards women as less safe aviation workers than men may be fading.

Emma-Jane Lacy, from CTC Aviation, says she's never come across male students reporting they did not want to be trained by a female, because of safety.

"The only ones I've had issues with, male instructors have also had issues with.

"Trainees have reported that they enjoy flying with female instructors. They find them more patient than the men, and more constructive in their approach."

## The (Virtually) Invisible Woman Engineer

If there are few women pilots, the situation with women engineers is even worse.

Latest statistics show that of the 2463 aviation engineers in the country, 24 – or one per cent – are women.

The Boeing study also found that over the next two decades, there'll be a global shortfall of 609,000 engineers. Again, the highest demand will be in the Asia-Pacific region.

CAA System Safety and Project Specialist, Beth Coughlan, became an aerospace engineer because she was good at maths and science at school.

"And aerospace engineering looked cool!"

Beth says one of the biggest barriers to women becoming aviation engineers is the general consensus, in her opinion, that it's women who need to change, and not the work environment.

"But diversity in the workforce actually adds to safety. For instance, under Safety Management Systems, one of the first steps is to identify hazards.

"If everyone in the room is alike, with shared experiences, all thinking the same way, it is much harder for them to 'think outside the square' to identify all possible hazards. Diversity – including women staffers – brings that outside thinking to the process."

Photo courtesy of Airways.

Airways Chief Operating Officer, Pauline Lamb, struggles to identify any innate differences between male and female air traffic controllers that would make one sex better suited to the work than the other.

Working for the CAA's Aircraft Certification Unit is Airworthiness Engineer, Andrea Wadsworth.

"An engineering degree seemed like the best combination of maths and science, and applicable and useful in real life," she says.

The women say being an engineer – or not – is down to individual traits, not gender.

"At university" says Andrea, "my grades were just as high, if not higher, than my male friends in the same classes.

"Not all women are cut out for engineering, but you'll meet a lot of men who aren't either."

Beth and Andrea are part of Futureintech, an initiative by the Institution of Professional Engineers, to encourage young men and women into the sector.

But Andrea says encouraging young women is tough going.

"I went to a recent Futureintech forum, and the only women there were the mothers of the boys attending.

Beth says support at schools is really essential to bring girls in.

"How many career advisors know about aeronautical engineering?"

The women agree that role models are vital.

"The lack of women in aviation is self-perpetuating," says Beth. "Men have any number of role models and mentors who they can relate to, and who can help inspire and shape the direction of their career. The small number of women in aviation creates a vicious circle."

6 *Gender Issues in Aviation: Pilot Perceptions and Employment Relations.* Mitchell J, Kristovics A, and Vermeulen L, Western Sydney University, 2006.

7 *Current Market Outlook 2015-2034: "Demand unprecedented for pilots and technicians".* Boeing, 2014.

8 *Gender Issues in Usability of Glass Cockpit for General Aviation Aircraft.* Koglbauer I, Braunstingl R, Fruehwirth K, Grubmueller E, Lösch S, Institute of Mechanics, Graz University of Technology (Austria), 2014, in *Absent Aviators: Gender Issues in Aviation*, 2014.

9 *Managing Risk – The Human Factor.* Geoff Trickey and So Yi Yeung, Psychological Consultancy Ltd, 2011, data updated 2016.

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## Elsewhere in Aviation…

There are higher numbers of women in air traffic control. Twenty-two percent of the workforce are women, which according to Airways, correlates with the percentage of applicants for ATC roles.

Three of the seven-member Airways executive are women, as is its head of training, and the board chair.

Chief Operating Officer, Pauline Lamb, struggles to identify any innate differences between male and female air traffic controllers, that would make one sex better suited to the work than the other.

"Being a team player is important to the role, and women are generally good team players," she says.

"But generally, the skills needed to make a good air traffic controller are spread pretty evenly.

"Spatial awareness is important. If you can play three-dimensional chess, and always have a Plan B, C, and D in your back pocket, then you should do well.

"The sorts of skills used with gaming, I'm sure, help with the aptitude tests we run as part of the selection process.

"As expertise in information technology increases among young women, so too does the number of them interested in becoming an air traffic controller."

Pauline Lamb says there's no discernable difference in test scores between male and female.

Where there is a challenge for women, she says, is in the area of career-family balance. "Airways tries to be really flexible to accommodate air traffic controllers who are also mothers. And if they leave to raise their family and wish to return later, we help to support their training to do that.

"Many women underestimate their qualities, so we also encourage them to put their hands up for professional development. That way we can have a diverse managerial community."

President of the New Zealand Association of Women in Aviation, Sue Telford, agrees that to encourage females, the sector has to become more flexible.

"It's an expensive career to train in, and often, just as women are making their way up the aviation career ladder, thoughts of starting a family intervene.

"I'm not aware of too many general aviation organisations yet, catering for the need of women to take time out to raise children, and then allowing them to re-enter the company in the same role."

Sue says a combination of that career/family 'rub', still-present sexism, and a lack of role models have combined to make an aviation career invisible in most young women's plans.

"It won't be until we get more women in aviation leadership roles, that girls will look at it as a possible option," she says.

"But we won't get more women in leadership roles, until there's a genuine and widespread acknowledgement that women are perfectly able aviation workers – in some areas, more able than men.

"Aviation is taking time to mature. I go to parliament and there are plenty of women MPs. I go to aviation events, and the room is full of men." ■

Photo courtesy of Airways.


Ondine Roxburgh, air traffic controller at Airways' radar operations centre in Christchurch.

# Your SMS is Yours and Yours Alone

Your SMS needs to be tailored specifically to your operation to manage your risks and build a safety culture that works for you.

No two aviation organisations are quite the same. You might run a similar operation to your neighbour, but your staff, aircraft, premises, hazards, and associated risks may be totally different. That's why your SMS needs to be tailored to your business.

"You can't just pick up a template and insert your name and be done," says Chris Lamain from the CAA's SMS team.

Developing an SMS plan is different from the ordinary process of writing an exposition.

Some organisations may make use of a consultant to develop their implementation plan (as part of the broader SMS implementation process) – and that's fine, providing they really understand your business.

Most experienced consultants deal with safety across a range of codes of practice and legislation.

"Consultants can be very valuable to your business but they need to spend time on site and talk with your staff. If they don't, how can they best understand your business?" says Chris.

One consultant who works with several organisations on their SMS implementation is Heather Andrews. Understanding the organisation is her first priority.

"I need to thoroughly understand the organisation, including its goals and objectives," says Heather. "What the company structure looks like; what certificates it has, and any codes of practice that may be relevant to the organisation.

"Once I understand that, I do a 'gap analysis' against the relevant standard based on the organisation's exposition. This helps the organisation identify the best way to close those gaps. From there, a work plan can be implemented with accountabilities."

Heather says that the most important part of any SMS is commitment from senior management.

"There should be regular involvement of senior management, including the CEO, through attendance at safety committee meetings and training sessions," says Heather.

"Cultural changes are difficult to achieve, so an effective implementation plan needs to provide plenty of time for training sessions and for people to become comfortable with the new processes.

"If staff see senior management interested in safety then they also will have more commitment to the SMS."

Heather says that time management is another major advantage in using an external consultant.

"Planning SMS implementation takes time. Sometimes these projects get left to the last minute and may not get completed to a standard that reflects the organisation. Using an external consultant can mean these projects get addressed in a timely manner."

Chris Lamain adds, "Your consultant needs to actively work with you, not just for you, to ensure your SMS truly is yours and yours alone – your ownership is vital to building and fostering a robust safety culture."

## Further Information

For more information refer to the CAA web site, www.caa.govt.nz, "Safety Management Systems (SMS)". You can also check out the articles "SMS – What it Means for You" and "Risk – Where to Begin", in the March/April 2016 edition of *Vector*. ■

# Part 61 *Pilot Licences and*

Changes to the recreational pilot licence (RPL), including the introduction of an RPL for helicopter pilots, will make getting a foot in the cockpit even easier. The agricultural sector will also experience significant training and rating updates.

The Part 61 re-issue came into force on 15 April 2016. Here are some of the key changes:

- The introduction of a recreational pilot licence helicopter (RPL-H).
- An RPL can be completed from the 'ground up' without a previous licence.
- Student pilots can now go solo using a land transport medical certificate.
- A new agricultural flight examiner rating.
- More specific agricultural pilot rating requirements.

A number of other changes have been made, including the ability to perform glider tow operations with an RPL, and recognition of New Zealand Defence Force pilot qualifications in the civil aviation system.

To view Part 61, see the CAA web site, www.caa.govt.nz, "Rules". To view a summary of the changes, see Amendment 11 in "View History of Amendments".

## RPL-H for Helicopter Pilots

The introduction of the RPL-H will enable helicopter pilots who don't hold a class 2 medical to fly under the less stringent New Zealand Transport Agency medical certificate, called a DL9.

"The reason for not initially introducing RPL-H in parallel with the RPL fixed wing, was that there didn't seem to be any market for it," says Bill MacGregor, CAA's Principal Aviation Examiner.

"However, judging from past feedback we received after the introduction of the RPL fixed wing, and recent enquiries, the RPL-H should prove to be pretty popular.

"It's set up under the same rules and conditions as the RPL fixed wing. You can carry only one passenger, you can't fly over built-up areas, and the weight limit is set at 1500 kg – the reasoning behind that is when flying over 1500 kg, a certified ground course is required.

Photo: istockphoto.com/sierrarat

The 1500 kg weight limit for the RPL helicopter makes flying aircraft, such as an early model Hughes 500, a possibility.

# *Ratings* Changes

"This weight limit means that people with early model Hughes 500s, and the like, will still be able to fly their aircraft. Also importantly, we haven't limited the RPL-H to piston aircraft.

"However, you can't do sling loads under the RPL-H. Sure, deer hunting is a recreational activity, but for those who intend to go hunting, you won't be able to carry out the game underslung," explains Bill.

The operating conditions and limitations for the RPL are designed to minimise any additional risks that may arise from the lower medical standards, and mitigate the consequences if something goes wrong.

## RPL from the Ground Up

Rather than transferring from a private pilot licence (PPL) to an RPL – perhaps because of an inability to gain a class 2 medical – you can now get an RPL from the ground up.

It's wrong to view the RPL as a lesser degree of licence. To attain an RPL from scratch, a student will need to sit all the same theory exams and flight test that are required for a PPL.

A pilot who already holds a PPL, commercial pilot licence (CPL), or air transport pilot licence (ATPL), can apply for an RPL, provided they have a current DL9. This requirement still applies even if they hold a current class 1 or 2 medical certificate.

## Going Solo

For some who undergo flight training, getting into the left seat and flying their first solo circuit is the endgame.

"If all a student wants to do is go solo," says Bill, "as some people do, a class 2 medical (which is reasonably expensive) is no longer a prerequisite."

The DL9 is all that's required. That means it costs students less to go solo.

"If the student decides they want to take the professional route, for which a PPL is the start, then they must have a class 2 medical before sitting the final flight test.

"Obviously, if they're serious about flying, they'd do a class 2 medical to begin with. This way any red flags can be identified early.

"Additionally, under Part 61, we've increased the time available to gain PPL subjects up to three years, remaining valid for a three-year period. This change aligns standards with the CPL," says Bill.

## Agricultural Changes

The changes in Part 61 to the agricultural ratings and training are supported by the agricultural aviation sector risk profile completed in mid-2013. It identified the need to lift training standards.

There's a 'grandparenting' period of over a year that should enable a smooth transition period between training requirements.

"One of the most important changes is the introduction of an agricultural flight examiner," says Steve Kern, CAA's Manager Helicopter and Agricultural Operations.

The introduction of the flight examiner aligns the agricultural sector with the airline and general aviation sectors.

"We see the examiners having a key role in raising the standard of E-cats. There'll be a new E-cat competency check assessed by the flight examiners. We'll be expecting this to be a thorough and meaningful check.

"At the entrant level, the structure of the pilot chemical rating has changed. It's now a prerequisite of the agricultural rating.

"Additionally, the chemical rating refresher requirement has been increased from three to five years, which should be a big plus for industry. The intention was to line it up with approved handler's certificates.

"Following on, the agricultural rating structure has been split into three specializations: top dressing, spraying, and an aerial vertebrate toxic agent (VTA) rating."

The VTA rating is quite similar to top dressing, but there are some specific precautions that the pilot needs to know about.

"In the past, the agricultural rating was all-encompassing, but it didn't always do a good job of assessing particular areas of expertise. We'd regularly see instances where a pilot would do the most convenient competency check, but then proceed to do the bulk of their work in a different competency.

"After you do the 'prime' specialization towards your agricultural rating, you can add on one or more of the other specializations at any time by completing further training and getting the additional rating(s)," says Steve. ■

*The introduction of the RPL-H will enable helicopter pilots who don't hold a class 2 medical to fly under the less stringent New Zealand Transport Agency medical certificate, called a DL9.*

# Places **Not to Drone**

Late last year in California, a massive wildfire swept across Interstate 15 destroying 20 vehicles. Firefighters may have been able to contain the blaze if drone users hadn't prevented emergency aircraft from operating.

The Remotely Piloted Aircraft Systems (RPAS, generally known as drones) rules, that came into force 1 August 2015, provided drone users with more certainty about their privileges.

But with airspace privilege comes airspace responsibility.

To keep our skies safe, it's essential that all drone users have a sound understanding of the rules and knowledge of airspace.

In the Californian event, before firefighting operations were suspended, the drones actually chased some of the manned aircraft to capture the most dramatic footage possible.

What those users didn't understand, is that their drones are in fact 'aircraft', not just toys or a handy photography platform. When flown in an unsafe way, they have the potential to cause serious harm.

## Avoid Wildfires

Flying drones near wildfires without permission creates a hazard for manned aircraft that are attempting to fight the fire.

Wildfires can spread as fast as 10 km/h hour in forests, and 22 km/h in grasslands. Aerial firefighting is an important tool in the firefighters' arsenal, and is usually employed in conjunction with ground-based teams. There have been instances overseas where aircraft have extinguished fires long before ground crews were able to reach them.

Without aerial firefighting, the Rural Fire Authority's ability to put out wildfires is seriously hindered, says Ian Millman, Manager Rural Fire Resource and Development.

"Unfortunately, there have already been some drone occurrences involving wildfires reported in New Zealand.


Photo courtesy of Transpower.

"We need everyone who flies drones to understand the importance of keeping away from vegetation fires and other emergency situations at all times.

"During a fire, drones are difficult to see from the air, as they blend with the ground view and smoke conditions. Unauthorized drones flying near a vegetation fire will lead to aircraft being grounded by the fire manager. Unauthorized drone use in emergency circumstances could result in a catastrophic accident, such as a mid-air collision.

"The only time that drone users may fly under these circumstances is if they have the appropriate approvals from emergency services," says Ian.

## Avoid Powerlines

Take particular care when operating near overhead transmission and distribution lines. If your drone accidentally contacts an overhead line, alert your local electricity distributor immediately, and if it's stuck, never try to retrieve it yourself.

Northpower, an electricity distribution company, recommends maintaining a distance of at least 20 metres at all times.

Transpower is the owner and operator of the national grid. Its General Manager of Grid Performance, Jim Tocher, implores drone users to maintain a safe distance.

"We would advise UAV operators to use their aircraft well away from high-voltage transmission lines and substations," says Jim.

"They have the potential to put the public, our staff, and contractors at risk, and disrupt power supply."

Two incidents occurred in September 2015 where drones were operated close to power lines. One drone struck a Transpower high-voltage transmission line in South Canterbury, and the other contacted an overhead line on Northpower's distribution network in Northland.

In the Transpower incident, the drone operator took responsibility and phoned their local distributor immediately.

Apparently, the drone lost communication and automatically returned to its programmed base. On the pre-programmed return flight, it struck the 220 kV Roxburgh-Islington transmission line.

It's a good example of why, before flying, you need to check the drone's settings to ensure the automatic return to home function will be conducted at a height that will keep it clear of overhead lines and other obstacles.

"That drone had to be removed by experienced live-line crews, so that we could avoid potential power outages," says Jim.

Northpower was not so lucky. The Northland overhead line incident caused a flashover (an electrical short-circuit through the air). It destroyed the drone and triggered a 20-minute power outage, during which 200 local businesses were forced to stop work.

Fortunately, no one was injured and the line didn't come down, but the risk could have been avoided had the operator been aware of the lines and maintained minimum safety distances.

## More Info

All the information you need to pilot your drone safely is available on the CAA web site, www.caa.govt.nz/rpas. Pay close attention to Part 101 and Part 102, and Advisory Circulars AC101-1 and AC102-1.

A number of organisations are now providing training specifically for RPAS operation. Formal training is recommended for all RPAS operators. See the CAA web site for a list of approved trainers.

Information about flying safely around electricity networks can be found at www.transpower.co.nz – search "drones". ■

# Aircraft **Data Plates**

The data plate is a vital component of an aircraft that uniquely identifies it. Therefore there are rules governing what you must do with the data plate when swapping aircraft components.

"Identifying an aircraft by serial number is needed so its maintenance and service history is known," says Shaun Johnson, CAA's Manager Aircraft Certification.

"This is extremely important for safety due to service lives of components, or recalls of parts, as well as being able to identify which Airworthiness Directives are applicable to the aircraft."

Civil Aviation Rule 21.803 *Identification of aircraft, aircraft engines, and propellers* requires any person who manufactures an aircraft or product under a Part 148 certificate to install a data plate that carries the information specified in rule 21.805 *Identification information.* This includes the manufacturer, the model designation, the serial number, and the applicable type certificate.

The Federal Aviation Administration in the United States also has a similar rule and it's common, if not required, practice in most other countries that manufacture aircraft. Therefore, all type-certificated aircraft (except some older British aircraft), have such a data plate installed. This data plate is used to identify the aircraft by serial number, and provide evidence that the aircraft conformed to its type certificate at the time of manufacture.

Rule 21.809 *Removal and reinstallation of data plate*, states that no person shall remove or reinstall a data plate without the Director of Civil Aviation's approval, except where it's necessary for maintenance, and in accordance with techniques or practices acceptable to the Director.

For example, in some cases when an aircraft is being painted, the data plate may be removed.

In all cases, the data plate must be reinstalled on the aircraft or product from which it was removed. AC21-6 *Identification of products and parts – identification information, provision, and replacement* provides further guidance on this.

Therefore, a data plate installed by a manufacturer remains with the aircraft it was installed on at the time of manufacture for all of its service life. A data plate cannot be installed on another aircraft.

Sometimes the information on the data plate can change. This is often the aircraft model, if it's converted from one model to another in accordance with acceptable technical data provided by the manufacturer. In most cases, the manufacturer will provide a replacement or supplementary data plate and authorize its marking and installation. They may also authorize the original data plate to be altered.

The aircraft model details may change but the aircraft serial number doesn't. The serial number is the one piece of data that is unique to the aircraft and remains

*A data plate cannot be installed on another aircraft.*

Photo: istockphoto.com/sierrarat

unchanged throughout its life. However, suffixes or prefixes may be added to indicate a change of model or configuration if the manufacturer specifies this.

So what actually constitutes the individual aircraft or product in question? Could each individual part be replaced during maintenance until not a single original part remains? Is there a minimum part, such as the fuselage the data plate is attached to, which cannot be replaced?

"Generally speaking, the aircraft data plate and the fuselage it's attached to effectively constitute the basic component of the aircraft," says Shaun.

"As such, moving data plates from one fuselage to another is not allowed. The only exception is where the manufacturer authorizes the replacement of a fuselage as a spare part with its own part number and possibly a component data plate.

"The fuselage in that case, however, would be a very basic structural assembly. To replace the fuselage would require the transfer of a large number of other parts and sub-assemblies that go together to produce a fully completed fuselage. This could only be done with the support of the type certificate holder and conducted in accordance with acceptable technical data," says Shaun. In either case, the following fundamental continuing airworthiness principles apply:

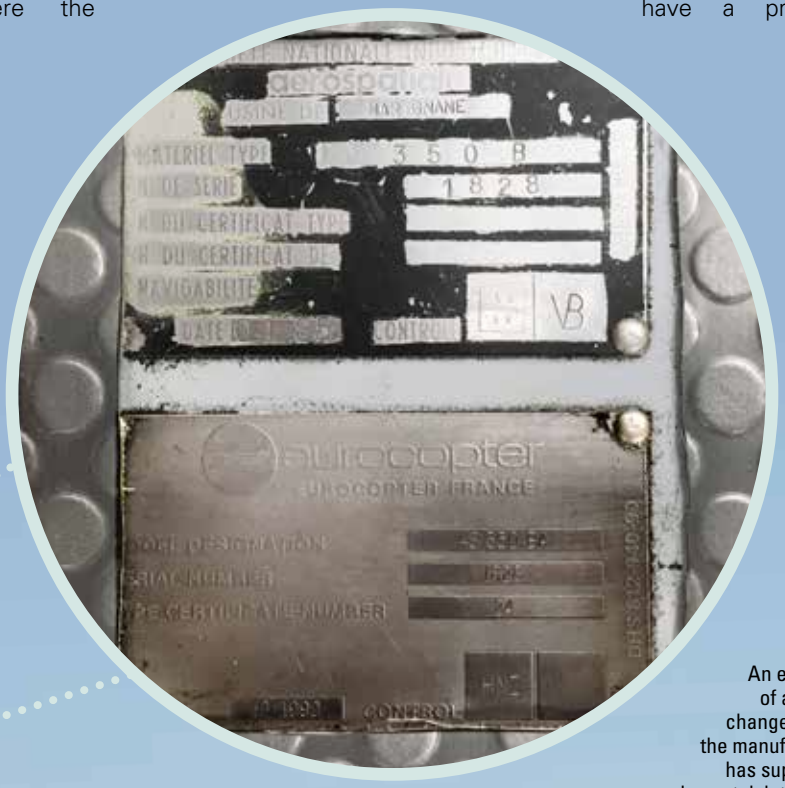
» There should always be a complete maintenance history for all work carried out and any components changed, so the complete history of the aircraft and its constituent components can be traced in accordance with rule 43.69(a)(2) *Maintenance records*.

» All changes of components should be in accordance with acceptable technical data, and as permitted by the type certificate holder in accordance with rule 43.53(3) *Performance of maintenance*.

Sometimes a data plate can be lost, for example, due to corrosion. Most type certificate holders have a process whereby a replacement data plate can be obtained for genuine situations. The process usually requires a formal application, and a letter of support from the aircraft's state of registry national airworthiness authority.

If you have any further queries about data plates, please contact the CAA's Aircraft Certification Unit by emailing airlines@caa.govt.nz.

For further reading, see the article "Data – It's Called 'Acceptable' for a Reason" in the March/April 2016 issue of *Vector*. ■




An example of a model change where the manufacturer has supplied a supplemental data plate.

## Examples of how these rules apply:

During a preflight check, the pilot notices from the marks and holes in the fuselage that the aircraft data plate is missing. The maintenance engineer can see that the rivets have corroded and vibrated away.

The engineer finds out that the aircraft manufacturer specifies a process for applying for a replacement, and fills out the application.

The engineer also applies to the CAA for a letter supporting the application.

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An owner seriously damages the nose of a light aircraft after running off the end of the strip. He buys and imports a complete second-hand fuselage which has an existing aircraft data plate. He asks his engineer to replace the fuselage on his aircraft and keep its original identity.

The engineer consults the aircraft manufacturer who advises the fuselage is not a replaceable part. Consequently, the engineer tells the owner that he can rebuild the imported fuselage into a complete aircraft using the other major parts and components from his damaged aircraft, but the aircraft identity would be that of the imported fuselage, with its original data plate. It will need to be registered in the new identity and get a new airworthiness certificate.

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An owner discovers during a major check that a helicopter fuselage has extensive corrosion and cannot be cost-effectively repaired.

The maintenance engineer determines that the type certificate holder does allow the fuselage to be replaced.

The engineer obtains a replacement bare fuselage shell and transfers all the components from the written-off fuselage to the new fuselage shell to build up a compete helicopter. The engineer then attaches the aircraft data plate to the completed helicopter, and documents the whole process in the aircraft logbook including the attachment of the data plate.

# Flying Under the **Roo**

New Zealand helicopter pilot Jason Laing earned his wings in the Southern Alps. That was good experience for someone who went on to rescue people off the treacherous slopes of Mt Everest.

Jason Laing is a study in resolve.

Leaving school at 14, he never wanted to be inside a classroom again.

But, after working in a variety of jobs, he decided to pursue a long-held fascination for flying, applying to Canterbury Aviation Academy.

The college said that with help for his dyslexia, they believed they could get him through.

They did, and now Jason – with 6,500 helicopter hours – has been honoured three times over the last two years for his extraordinary rescue and recovery helicopter work in Nepal.

"I've always been comfortable flying in mountains. I flew in Fiordland and the Southern Alps for about 15 years, before three seasons in Kashmir, mainly heli-skiing work at 15,000 ft.

"It was a short hop to Nepal, to work the climbing seasons there, starting in 2012, ferrying climbers and gear between the Himalayas and Kathmandu."

Then on 18 April 2014 came the Everest avalanche at 20,000 ft, that killed 16 Sherpas. Other helicopter pilots said they did not have the skills to fly in and pick up survivors and bodies.

But in his Squirrel, Jason made 16 rescue and recovery missions, the air so thin and power so marginal, that only one person could be lifted out at a time.

The Nepal Mountaineering Association recognised Jason's rescue and recovery work with its Kumar Khadra Bickram Adventurous Award. The Fédération Aéronautique Internationale (FAI) made Jason the 2015 recipient of its Diploma for Outstanding Airmanship, and Helicopter Association International (HAI), made him its 2016 Pilot of the Year.

A year later, the devastating 7.8 Nepalese earthquake triggered a series of avalanches including one on Mt Everest that killed 22 people.

Jason was one of three pilots who recovered 140 survivors from Camp One, at 20,000 ft, and Camp Two, a thousand feet higher.

"You always go and have a reccie," he says, of the decision to make those hazardous missions. "You can always say 'no'.

"Usually, you're told something can't be done because of the weather. But you go and have a look, and sometimes the weather clears a little. It's an hour's

Photo courtesy of Jason Laing.

# f of the World

flight between Kathmandu and the climbing area, and the weather can improve before you arrive, and you can do something. But sometimes you can't."

That commitment to attempting a rescue, however, in no way overrides other considerations.

"In the Himalayas you're often flying close to the machine's limit of 23,000 ft. Go or no-go decisions are based first and foremost on how high we would have to go to attempt a rescue.

"Also, the company I fly for in Nepal has a big ground staff, there are a lot of mouths to feed. The decisions I make on the sharp end ultimately affect the company, and all those people, and the aircraft, so I don't want to push it too much."

Jason also won't fly a mission if his crewman, Chhiring Bhote, isn't happy.

"We decide jointly on the feasibility of a mission. Chhiring is a 23-year old Sherpa, who's been trained in Switzerland in long line rescue work. I can put him down on really steep terrain at about 22,000 ft, without oxygen.

"So he's got to be happy about where we're going and what he's going to have to do.

"After the 2014 ice avalanche, I dropped him into a crevasse at over 20,500 ft to get a mountaineer who'd been hanging onto his climbing ropes all night, without oxygen. I lowered Chhiring down on a 200 ft long line to get the guy. It was an extremely difficult job, probably the hardest long line job I've ever done."

But Jason is no save-at-all-costs gung-ho hero.

"I've had situations where I know there are climbers in real trouble, but the weather is just too hazardous to attempt a rescue.

> *"You have to be tuned in all the time to what's happening right now, what's about to happen, and what could happen."*

"The best time for a mission is during a two to four-hour window around the middle of the day. Earlier than that, the sinking cold air of the katabatic winds pushes you downwards.

"Then during the afternoons, the anabatic winds drag in clouds and moisture. This is known as the 'Dragon's Breath' in the Himalayas and that's not much good either.

"On top of that, the area between Camp One and Two on Everest is a big white bowl known as the Western Cwm (pronounced 'coom'), and it can be warmer there than at Base Camp.

"Because the machine loses performance in the heat, and at altitude, it can be impossible to pick someone up from Camp Two.

"Sometimes, we'll stay overnight and try again in the morning. But we can be too late.

"The pressure to fly the rescue mission can be enormous – particularly from fellow climbers – and it can be a very hard decision to make, but in the end, I won't put Chhiring, or the aircraft, in peril."

His success in flying in mountainous terrain is partially due to the fact that Jason sticks to his safety limits. Always.

"I don't use transient limitations to hold a hover. My transients are outside the safety envelope and I don't rely on them. Instead, I'll do a hover 300 ft away from the area, with a good escape route, and that's when I do the first power check.

"Then I'll move over the subject and do another power check, then I know 100 per cent that I can do the job without that extra risk. Only then will we put the long line on."

Jason also provides himself with an extra safety net by utilising ground effect where he can.

"In our flight manuals, it shows that at a certain altitude at a certain temperature, you can hover out of ground effect. That takes more performance than to hover in ground effect. So I'll use out-of-ground effect performance figures to give me a safety buffer."

In Nepal, engineers take care of the preflight and postflight checks, and sometimes, on a multi-day mission, one will fly with Jason as a second crewman.

*Continued over* ❯❯

Jason's 'office' the Himalayas, with Everest in the background, far left.

Continued from previous page

Photo courtesy of Michael Madden.

Jason flying at the Western Cwm at 20,000 ft on the way to Camp Two.

"The engineers check over the machine after every mission," says Jason. "And I trust them completely, we work together as a team, this is very, very important."

But the attribute Jason says is indispensable to safe mountain flying is observational skills.

"You have to have vigilant situational awareness," he says. "At altitude there's oxygen management; fuel management is more critical, and the weather can close in, not just in front of you, but also underneath you. And you're constantly analysing your air densities, and weight and balance.

"You have to be tuned in all the time to what's happening right now, what's about to happen, and what could happen.

"In Nepal, that applies to the ground operation as well. You land at Everest Base Camp, you've got two or three Sherpas pulling open doors and hauling stuff out. I cannot take off my oxygen and get out of the helicopter, so I have to keep a really close eye on them. There are a million things that can go wrong. You have to check and double check: 'how heavy was the gear they put in?', 'did he close the doors properly?', 'did he put the seat belt in?', 'has anyone checked for loose items?'

"There are a lot of hidden traps in Nepal. Hitting wires is one of them – they don't exactly string them from power pole to power pole but from tree to tree and from any structures. You always have to have your eyes open."

Jason also practises something he was taught while working in Antarctica: 'take five'.

"Step back, count to five and really think about what you're about to do. Pause to reassess your decision. That's saved me many, many times in Nepal."

To learn more about the sort of flying Jason does, email info@caa.govt.nz to get a free copy of the GAP booklets, *Helicopter Performance* and *Mountain Flying*. ■

## Jason says he has never forgotten these 'golden quotes' from the pilots who have mentored him through the years.

***"You must be in tune with your machine."***

Simon Spencer-Bower, with whom Jason trained in 1998, and who was the recipient of the Helicopter Association International award for Flight Instructor of the Year, in 2015.

***"Line all your ducks up in a row before you commit to a task: right speed, right power, right descent."***

Neil Scott, who was Jason's commercial flight examiner.

***"There's a lot of air out there. Use it. There's no need to get too close to anything, unless you're landing."***

Louisa Patterson, who trained Jason in Hughes 500s and Fiordland operations.

***"With the way the weather is in Fiordland, it's all about making the right decisions and making them quickly."***

Sir Richard Hayes. Jason flew for him for 10 years, and gained his search and rescue skills with him. Jason says he carried those skills on to his work in the Himalayas.

# **Welcoming Steve Backhurst** as an Aviation Safety Adviser

CAA's aviation safety advisers play a key role liaising between participants and the CAA, often being a participant's first port of call with any issues they need to discuss. In late March, Steve Backhurst was welcomed into the fold.

Steve joined the Safety Promotion Unit as the South Island's Aviation Safety Adviser (Maintenance) following Bob Jelley's retirement. While it's a new role for Steve, aircraft maintenance has been in his blood since he was a teenager.

A 'few' years ago, Steve went straight from high school to Air New Zealand with an apprenticeship in aircraft sheet metal, gaining an aircraft engineer certificate. He worked on a wide range of Air New Zealand aircraft including Boeing 737, 747, 767, DC8 and DC10, and Fokker Friendships. He was there initially for 11 years, finishing up as a materials test engineer.

After a short break, Steve returned to Air New Zealand as a maintenance engineer on the hangar floor in Christchurch. He spent 20 years with the national carrier all up.

He then spent seven years in general aviation, including a short stint at the Canterbury Aero Club, and was then employed by Pacific Aircraft Services as chief engineer.

Steve joined the CAA four years ago as an airworthiness inspector in the Helicopter and Agriculture Unit.

"As an inspector, I've spent a lot of time out with participants. And I'm looking forward to continuing to work with the whole aviation community."

And Steve filling the boots of Bob Jelley has a happy twist.

"Bob Jelley was the first CAA person I really had anything to do with," says Steve. "In fact, he was the one who encouraged me to finish some of my incomplete licences."

Steve now holds LAME categories in rotorcraft (group 1, 2, and 3) and powerplant, as well as an Inspection Authorisation Certificate.

"Bob helped me realise that working for the regulator is something to aspire to. It means you can really help participants reach a higher level of safety than the rules require," says Steve.

Bob Jelley retired from the CAA at the end of March 2016 after nearly 15 years.

His long-time fellow ASA John Keyzer says the best word to describe Bob was "passionate".

Bob holds licences for both fixed wing and rotary aircraft, and has even built his own RV-7.

"He had such a willingness to help everyone and was a great mentor to participants," says John Keyzer. ■

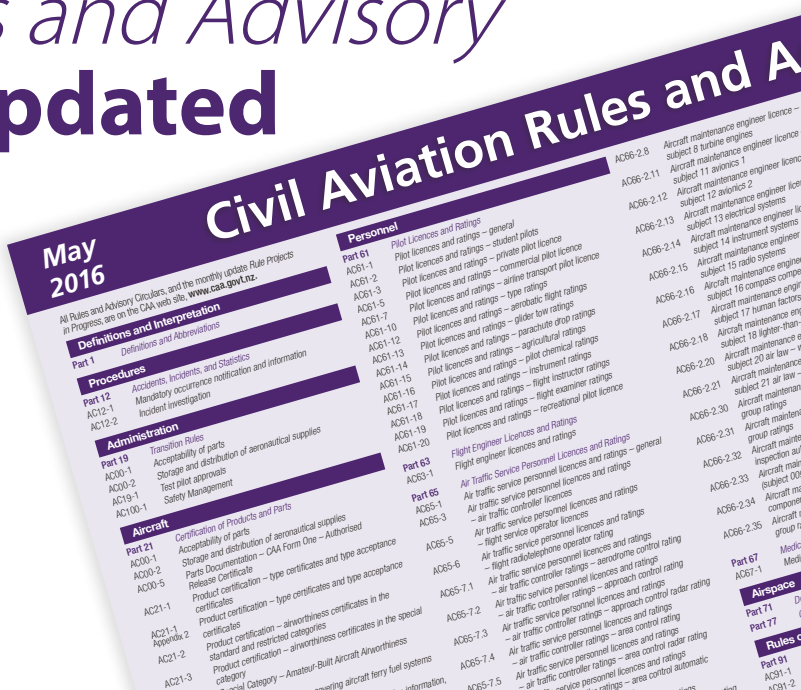
Steve Backhurst

# *Civil Aviation Rules and Advisory Circulars* **Poster Updated**

Enclosed with this issue of *Vector* is an updated version of the Civil Aviation Rules and Advisory Circulars poster.

Please replace any older versions you have with the new version – it's a different colour so you can easily spot the old ones. The Rules and Advisory Circulars are updated reasonably frequently, so make sure you subscribe to our email notifications at, www.caa.govt.nz/subscribe.

For additional copies of the poster, email info@caa.govt.nz. ■



# **Just Culture** and Rep

Many employers in aviation try to follow 'Just Culture' principles, and it is an issue often discussed. But how does the Civil Aviation Authority apply Just Culture principles? The Director, Graeme Harris, explains the regulator's approach and gives an assurance.

So what, exactly, are Just Culture principles in the view of the CAA?

"They recognise the difference between human error," says Director of Civil Aviation Graeme Harris, "at-risk behaviour, and recklessness, and treat them differently.

"If an incident has resulted from human error, it's pointless to punish the person involved. It's human to make mistakes, we all do it. So the CAA's approach is to support the person, learn from the information provided, improve the system if we can, and move on.

"A single at-risk action is up the line a bit from a pure mistake. But it's not unusual, for a range of reasons, for people to drift from compliance. The normal response to a single at-risk action is coaching, and examining the system that allowed that at-risk action to occur.

"Just Culture principles balance individual and system accountability."

The Director is frank about why he is talking about Just Culture at this time.

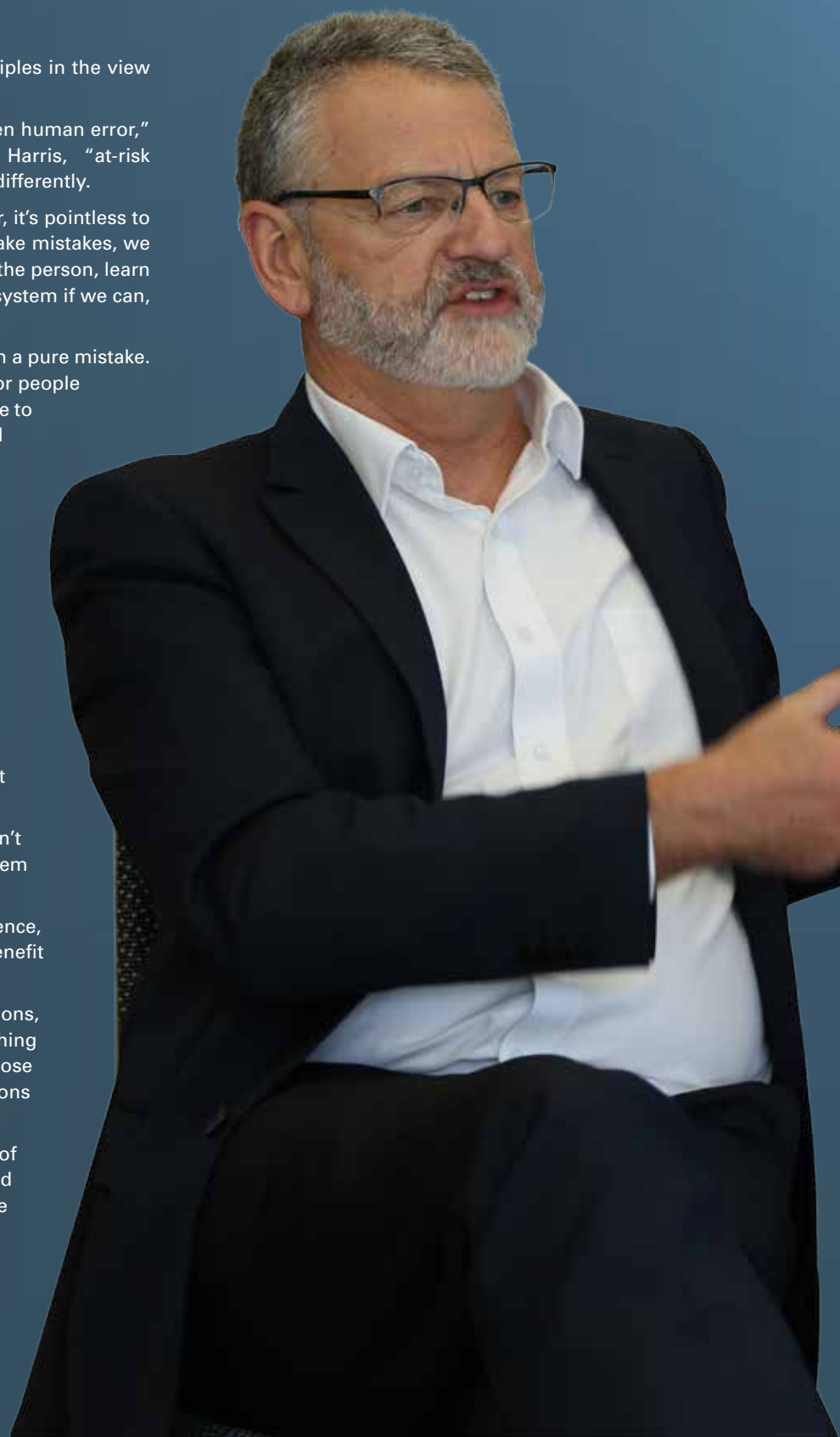
"We want to increase reporting. The recent risk profile of the Part 135 sector, Air Operations – Helicopters and Small Aeroplanes, has highlighted that a number of operators and pilots are not reporting occurrences because they're worried about the CAA's response to those reports."

The Director says when participants don't report, the results are two-fold, neither of them good.

"If someone fails to report an occurrence, everyone else in the industry is denied the benefit of learning from it, and acting on the lesson.

"For the CAA to build a picture of flying conditions, and where most risk lies, and to do something positive about that, we need to hear from those who deal every day with the coalface conditions of aviation in New Zealand.

"The second thing that happens as a result of non-reporting, is that it exposes those involved to increased risk of enforcement action if the CAA does learn about the event."



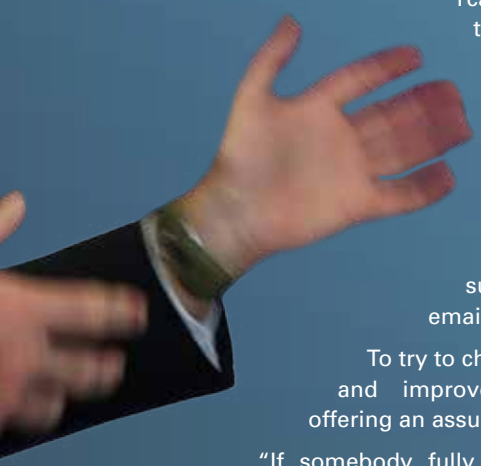
# porting

Graeme is aware there's an 'urban myth' behind much of the failure to self-report: that reporting an occurrence means the person involved will likely end up in court.

"The stats, however, don't bear that out. Over the last five years, the CAA has received about 32,500 reports and complaints, from the public, from industry, from CAA personnel. In that time there have been just 79 prosecutions.

"I don't believe there is any rational basis for a pilot, for instance, to worry about sanction if they report an incident they caused.

> *"If somebody fully, frankly, and in a timely fashion, reports their involvement in an incident, the CAA will apply Just Culture principles when it looks at what contributed to that event."*



"I cannot recall any prosecution taken over an incident during the last five years, where the CAA learned about it only through a report by the person involved.

"If anyone knows from personal experience of such a case, I invite them to email me."

To try to chip away at the urban myth, and improve reporting, Graeme is offering an assurance.

"If somebody fully, frankly, and in a timely fashion, reports their involvement in an incident, the CAA will apply Just Culture principles when it looks at what contributed to that event.

"We will not apply those principles, however, where there's no self-reporting and we learn about the incident from some other source."

Graeme says there's a good reason why self-reporting of incidents, and non-reporting, are treated so differently by the CAA.

"Frankly, it's carrot and stick. We want to improve the reporting we otherwise wouldn't be aware of. So we undertake to apply Just Culture principles only to self-reporting."

With regard to repeated at-risk actions, or recklessness, Graeme says everyone would understand why they might be more likely to attract a penalty.

There is also another type of occurrence where Just Culture principles may not apply – an accident where harm results.

Graeme illustrates why, using the following scenario.

*"A car drives through a red traffic light due to human error. There's no conflicting traffic and the car proceeds safely on its way. A second driver does exactly the same thing, once again due to human error, but this time a van carrying the local pre-school group goes through the conflicting green light and is 'T-boned' by the first car. The car driver survives but four toddlers are killed and a number seriously injured. You're the local road traffic safety authority and you learn about the two events. What action do you take with respect to each of the two drivers? Is it the same, or is it different?"*

Graeme explains that in a pure Just Culture environment, the drivers would be treated the same. They would be consoled, and the traffic safety authority would look for system fixes to prevent a recurrence.

"But in countries like New Zealand, the legal framework doesn't support such an approach. There's a limit to which regulators can commit to ignoring the consequences, of an action, even one caused by human error.

"People dying or being seriously injured does drive regulator response. That's why whenever a regulator announces with fanfare that they are henceforth applying Just Culture in all their dealings, you really do need to look for the fine print.

"But I've tried to be clear and honest about the limited scope of Just Culture as applied to occurrence reporting, so there is no fine print for aviation participants to worry about." ■

The easiest way to report an occurrence is online, www.caa.govt.nz/report, or use the *Here and Now* app.

Look up Part 1 of the Civil Aviation Rules to read definitions of an accident, serious incident, and incident.

The *How to Report Occurrences* booklet is available free by emailing info@caa.govt.nz.

# Landing Your Helico

Just because your helicopter is able to pretty much land anywhere doesn't mean it should. There are rules about where you can land, and sometimes it just comes down to flying neighbourly.

"It all comes down to rule 91.127 *Use of Aerodromes*," says Roger Shepherd, CAA's Investigating Officer ARCs. "Put simply, the place you're going to operate your aircraft to or from needs to be suitable for taking off and landing."

That means it has to be fit-for-purpose. Is the space big enough for a helicopter to land? Are there any obstacles or hazards to a helicopter operation like telephone poles, buildings, or trees?

Then there's ownership of the land. While the Civil Aviation Rules don't require express permission from the land owner, Roger says it's a very good idea to have this. "Not only because it's the courteous and 'flying neighbourly' thing to do, but you'll learn much more about any hazards in the area you're landing in, including wires."

Some aerodromes may require permission before landing, so check *AIP New Zealand, Vol 4*.

There may be other restrictions covering where you're planning to land, for example conservation rules. Different councils may have restrictions where you can land your helicopter. You should contact the relevant council or landowners for further information.

## Approach and Departure Paths

If your helicopter doesn't have Class 1 performance (and most operating in New Zealand don't) then you have to ensure that all approach and departure paths have space to perform an autorotative landing in an emergency. This has to be possible without causing damage to people or property.

For example, if you're planning on landing in a reserve adjacent to a beach in a single engine helicopter, then your approach path can't fly over people picnicking in the reserve or on the beach. This of course can change from day to day.

One day you fly into a reserve by the beach; it's deserted and so you can come and go freely. The next time you go there, however, there could be a surf lifesaving competition, or a scout jamboree, or a family picnicking with their kids. In those situations you can't land there, so then what?

## Plan B

There's a good reason that 'always have a Plan B' is so often stated in aviation.

Photo: istockphoto.com/jarretera

# opter in a Public Place

"If you're planning on landing somewhere, a beach for example, what will you do if there are people where you want to approach and land?" asks Roger.

"You can't expect to just hover in your helicopter and wave your hands telling people to move."

You should know where your plan B landing spot is going to be. It may not be in the most convenient location, but it must be clear and safe to land.

## My Neighbour Doesn't Want My Helicopter Landing Here

"This is a common complaint," says Roger. "Recently, someone was building a new home in Northland and decided to visit the site by helicopter to check on progress. He planned on landing on a public reserve between his and another property. He doesn't need to ask adjacent property owners for this, but he did ask the closest property owner.

"However, another got upset about it and lodged an Aviation Related Concern which I followed up, explaining that the helicopter is allowed to take off and land there."

"Later, I contacted the guy doing the building, and explained that there had been a complaint.

"I asked how he would know the landing spot was safe, if he had been flying north for 30 minutes?

"Fortunately, he understood the importance of having another landing site – his plan B. He knew that if he couldn't land at his planned site, he had other options," says Roger.

## Closed Airfields

Sometimes, helicopters have landed at closed aerodromes. "This is definitely not OK," says Roger. "There are several reasons why an airfield can be closed. Most often it's a safety concern."

Some aerodromes have other activities taking place, such as drag racing, model jet races, or driver training, which make landing an aircraft hazardous, both for the aircraft and the people on the ground.

Remember, the white crosses are there for a reason and they apply to all aircraft – fixed wing or helicopters.

"Basically, if there are X marks on the runway, no aircraft can land there," says Roger.

## Summary

Where you plan to land must be safe. If you get there and find it's not, use your plan B.

If you're in a helicopter without Class 1 performance, you must have clear approach and departure points allowing you to perform an autorotative landing in an emergency without causing third-party endangerment.

The best advice the CAA can offer after following the rules is to fly neighbourly. Talk to other property owners that will be affected by your helicopter landing there. Keep the skies friendly and everyone will be happy. ■

### A Good Approach

A property owner up near Leigh, north of Auckland, had engaged a helicopter company to fly them in and out regularly for a few weeks. The property owner got permission from all his immediate neighbours, something he didn't actually need, but which makes things a lot easier for everyone involved.

The operator figured out an approach and departure path that would comply with the rules ensuring there was space for an autorotative landing if needed. They also wanted to ensure extra performance capability of the helicopter, so they limited it to two people on board and to operate in winds of 15 knots or less. This was important, as there was only one safe way in and out, and a strong easterly wind would make manoeuvring the helicopter a safe distance from the house difficult.

"They looked at all the possibilities to work out their plan, and that's what we would expect of every operator," says Roger.

# Technical Log Troubleshooting

Would you reject an aircraft during preflight inspection if the technical log wasn't up to date? Knowing who's responsible for raising the tech log and how to record maintenance activities will help you keep tabs on your aircraft's airworthiness.

The main function of the CA006 *Technical Log* (we'll call it the tech log) is to give the pilot a preflight snapshot of the aircraft's current maintenance status. To do this, all relevant maintenance, routine or otherwise, must be recorded between inspection intervals.

"Contrary to what a lot of people think, the responsibility of ensuring information on the tech log is accurately recorded and current, lies with the operator, not the maintenance provider," says Rick Ellis, CAA Aviation Examiner – Maintenance Engineering.

This confusion may stem from the fact that even though the maintainer is not responsible for raising the tech log, in real-world practice they generally do so.

The tech log must be carried in the aircraft, and should be used to record maintenance required between scheduled inspections. A release to service may be certified on the tech log, as well as the CAA400 *Maintenance Record Sheet.* All certified maintenance must be summarised in the aircraft logbook – as required by rule 43.69 *Maintenance records.*

## Operator Responsibilities

The operator of an aircraft must ensure tech log information is accurately recorded and current. You shouldn't be taking an aircraft flying with a tech log that hasn't been completed correctly.

To really get to grips with the requirements, make sure you read rule 91.619 *Technical log* and the Advisory Circular AC91-6 *Aircraft technical log.*

Rick Graham, CEO and Chief Pilot of Napier-based Shoreline Helicopters, says his main concern is pilots failing to check the tech log prior to flight.

"On several occasions when I've flown with pilots, I've found the annual review of airworthiness expired (and outside of the latitude period, had it been applied), or the date of the next inspection due has passed."

The annual review of airworthiness may be extended by a latitude period (which is usually 10 per cent, up to a maximum of 36 days) to allow for maintenance planning purposes.

"Sometimes, even when an overdue inspection has been rectified, there's no way to tell by reading the tech log, as the details haven't been recorded.

"Another thing pilots often overlook is maintenance due before the next scheduled inspection, eg, a four-month oil change. Once again, sometimes this has been done, but the details haven't been recorded correctly," says Rick Graham.

## Common Pitfalls

Make sure you have the correct information on the tech log. For example, you need to be sure which maintenance programme the aircraft is being maintained to, as this lets the reader know who is responsible.

Defects that arise must be recorded on the tech log.


This mock-up of a tech log shows one method of recording a maintenance interval extension.

Rick Ellis says, "Some think that they are able to record the defects separately – that's simply not the case.

"Also, before conducting any pilot maintenance, make sure you're sufficiently trained and authorized to do so, and any maintenance you carry out is recorded on the tech log and released to service," says Rick.

"A common error," says Steve Backhurst, CAA Aviation Safety Adviser (Maintenance),"is not correctly completing the ARA/ Maintenance Review section.

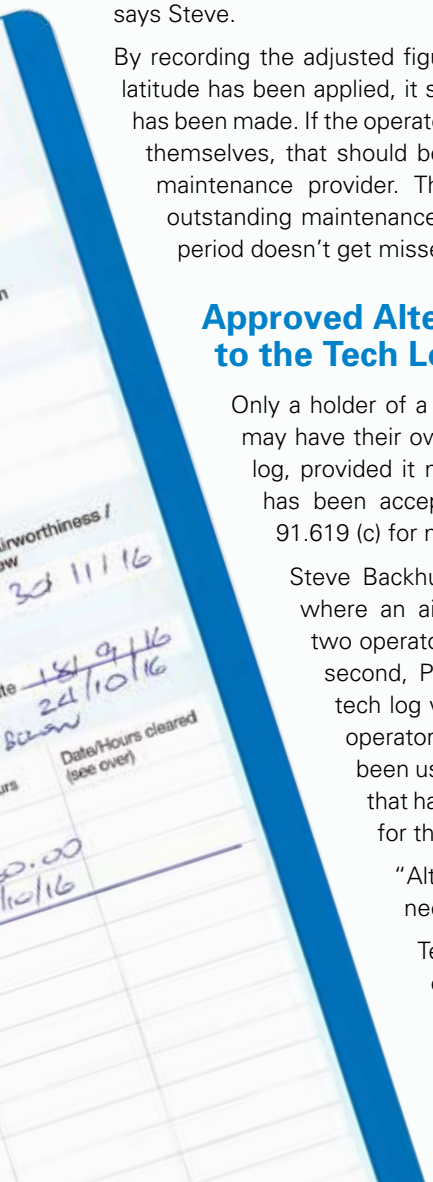
"You should put a line through one of the two options to record which option is relevant. Ensure that the next scheduled inspection due is recorded correctly.

*"The responsibility of ensuring information on the tech log is accurately recorded and current, lies with the operator, not the maintenance provider."*

"Also make sure you record any maintenance, routine or otherwise, that's required/conducted before the next scheduled inspection.

"If you extend an inspection interval, put that on the log," says Steve.

By recording the adjusted figure after an inspection planning latitude has been applied, it shows that a conscious decision has been made. If the operator intends to record an extension themselves, that should be done in consultation with the maintenance provider. This will ensure that any other outstanding maintenance required during that extension period doesn't get missed.




## Approved Alternatives to the Tech Log

Only a holder of a Part 119 air operator certificate may have their own approved version of the tech log, provided it meets all rule requirements and has been accepted by the Director. See rule 91.619 (c) for more information.

Steve Backhurst says, "I remember a case where an aircraft was being employed by two operators, one under Part 137, and the second, Part 119. In error, an alternative tech log was being used by the Part 137 operator. The tech log that should have been used for this aircraft was a version that had been approved by the Director for the Part 119 operator.

"Alternative versions of a tech log need to be approved," says Steve.

Tech logs are available free of charge from the CAA, email info@caa.govt.nz. ■

# Will You Own an Aircraft on **1 July**?

The Annual Registration Fee and Participation Levy are invoiced on 1 July to the registered aircraft owner on that day.

The registered owner must pay the fee and levy regardless of the state of airworthiness, or a pending sale of the aircraft.

The Civil Aviation Act 1990 defines "owner" as the person lawfully entitled to possession of the aircraft for 28 days or longer. This means if you lease the aircraft for 28 days or longer, you are deemed to be the owner.

If you're selling an aircraft before 1 July, a change of possession form must be received and actioned by the CAA before 1 July 2016, so you should send this in as early as possible to allow time for postage and processing. If the aircraft is still in your name on 1 July, you're liable for the invoice, even if you have sold the aircraft.

Once issued, the invoice can't be transferred to anyone else. Payment is due by 20 July 2016. If it isn't paid, the aircraft may be deregistered but the fee and levy will still be collectable. If the aircraft is deregistered, the Airworthiness Certificate, or Flight Permit, is revoked and the aircraft cannot be legally flown.

If you have any queries about the fee and levy, email: Aircraft.Registrar@caa.govt.nz. ■

## **New** Products

The *Aircraft Operator Requirements* poster has been updated, and now includes requirements for RPAS (drones). This poster gives a handy overview of everything you need to know if you own or operate anything that flies.

The *Fuel Management* Good Aviation Practice (GAP) booklet has also been updated, and includes the new colour of avgas.

For a complete list of free safety promotion publications go to the CAA web site, www.caa.govt.nz, "Publications".

You can request free copies of any of these products by emailing info@caa.govt.nz.


## Calling all **LAMEs and Glider Engineers**

Are you a Group 3 Licensed Aircraft Maintenance Engineer, or holder of a Gliding NZ maintenance approval with a W rating?

If there is sufficient interest, a seminar may be held at Masterton, with particular emphasis on the maintenance of aircraft all, or partly, constructed with wood and glue covered in fabric. Expect the seminar to be a mix of classroom and practical inspection of wooden structures with and without fabric covering.

Subjects covered (little pun there) will be: storage of wood structured aircraft; inspection procedures for glue failure; glue types and properties; glue deterioration; water penetration; and fabric strength testing.

If interested, please email John.Bushell@caa.govt.nz.

## How to Get **Aviation Publications**

### *AIP New Zealand*

*AIP New Zealand* is available free on the Internet, www.aip.net.nz. Printed copies of Vols 1 to 4 and all aeronautical charts can be purchased from Aeronautical Information Management (a division of Airways New Zealand) on 0800 500 045, or their web site, www.aipshop.co.nz.

### Pilot and Aircraft Logbooks

These can be obtained from your training organisation, or 0800 GET RULES (0800 438 785).

### Rules, Advisory Circulars (ACs), Airworthiness Directives

These are available free from the CAA web site. Printed copies can be purchased from 0800 GET RULES (0800 438 785).

## Planning an **Aviation Event?**

If you are planning any aviation event, the details should be published in an AIP Supplement to warn pilots of the activity. For Supplement requests, email the CAA: aero@caa.govt.nz.

To allow for processing, the CAA needs to be notified **at least one week** before the GroupEAD (Airways) published cut-off date.

Applying to the CAA for an aviation event under Part 91 does not include applying for an AIP Supplement – the two applications must be made separately. For further information on aviation events, see AC91-1.

| CAA Cut-off Date | GroupEAD (Airways) Cut-off Date | Effective Date |
|---|---|---|
| 6 Jun 2016 | 13 Jun 2016 | 18 Aug 2016 |
| 4 Jul 2016 | 11 Jul 2016 | 15 Sep 2016 |
| 1 Aug 2016 | 8 Aug 2016 | 13 Oct 2016 |

See **www.caa.govt.nz/aip** to view the AIP cut-off dates for 2016.

## Aviation **Safety Advisers**

Contact our Aviation Safety Advisers for information and advice.
They regularly travel the country to keep in touch with the aviation community.

**Don Waters**
(North Island)
Mobile: +64 27 485 2096
Email: Don.Waters@caa.govt.nz

**John Keyzer**
(Maintenance, North Island)
Mobile: +64 27 213 0507
Email: John.Keyzer@caa.govt.nz

**Carlton Campbell**
(South Island)
Mobile: +64 27 242 9673
Email: Carlton.Campbell@caa.govt.nz

**Steve Backhurst**
(Maintenance, South Island)
Mobile: 027 285 2022
Email: Steve.Backhurst@caa.govt.nz

## Report Safety and Security Concerns

*Available office hours (voicemail after hours).*

**0508 4 SAFETY**
(0508 472 338)
**isi@caa.govt.nz**
*For all aviation-related safety and security concerns.*

## Accident Notification

*24-hour 7-day toll-free telephone*

**0508 ACCIDENT**
(0508 222 433)
**www.caa.govt.nz/report**
*The Civil Aviation Act 1990 requires notification "as soon as practicable".*

# Accident Briefs

More Accident Briefs can be seen on the CAA web site, www.caa.govt.nz, "Accidents and Incidents".
Some accidents are investigated by the Transport Accident Investigation Commission, www.taic.org.nz.

## ZK-CTS Cessna 172S

| | |
|---|---|
| Date and Time: | 26-Jun-2015 at 12:00 |
| Location: | Hamilton |
| POB: | 1 |
| Damage: | Substantial |
| Nature of fight: | TRAINING SOLO |
| Flying Hours (Total): | 38 |
| Flying Hours (on Type): | 38 |

On landing, after completion of a 1.5 hour solo cross-country training flight, the aircraft touched down hard following an unstable approach. The aircraft ballooned back into the air, then bounced several times along the runway before coming to a stop. During the bounces, both the propeller and tail struck the runway causing extensive damage to the aircraft.

Approaching the aerodrome, the student was cleared for a Mystery Creek Arrival which he flew initially at 1800 feet. He was provided with a descent clearance approaching Mystery Creek, and to join direct for right base runway 18 right, the student's first landing on that runway. The student established the aircraft in a rapid descent in order to arrive at 1200 feet at the normal flap configuration point. Once the aircraft arrived at 1200 feet, the student re-set the nose attitude at idle power in order to stabilise the speed for flap extension. He then extended the first stage of flap. The student noted that the aircraft was initially high on the base leg.

The second stage of flap was extended just before beginning the final turn. During the turn, the student noted again that the aircraft was high on profile.

The student established on final using the PAPI lights for 18 left as his primary means for judging the approach profile. At no time did the student use any point on runway 18 right to project his approach profile, or use an aim point on the runway. He noted the aircraft was a few hundred feet high on approach. He stated that although he was high he could regain the approach profile by leaving the power at idle and lowering the nose. Once one red light appeared in the PAPI, the student applied power to stabilise the speed. He observed that the airspeed was 61 knots before crossing the threshold.

Just prior to touchdown, the student looked out the right side of the aircraft and sighted an aircraft on the taxiway. He made a judgement that his rate of descent was excessive, and instinctively pulled back on the control column to avoid hitting the ground too hard.

The landing was very firm, resulting in the aircraft bouncing back into the air. The student reactively checked forward on the control column, and as he did so, the aircraft descended towards the runway. He attempted to settle the aircraft back onto the runway using elevator, but was unable to. A subsequent loss of control was experienced and the aircraft porpoised down the runway until it came to a stop.

He noted that he was not able to use the controls normally. He had not adjusted the elevator trim during the approach – the trim was found to be at 1 cm nose down after landing. This would have made the aircraft more difficult for the student to control in pitch during the flare and subsequent bounce.

Following the accident, the student received additional training, and the organisation's training procedures were revised.

CAA Occurrence Ref 15/3149

## ZK-FGC Cessna 152

| | |
|---|---|
| Date and Time: | 10-Nov-2015 at 12:15 |
| Location: | Dunedin |
| POB: | 1 |
| Damage: | Substantial |
| Nature of fight: | TRAINING SOLO |
| Age: | 29 yrs |
| Flying Hours (Total): | 20 |
| Flying Hours (on Type): | 20 |
| Last 90 Days: | 13 |

Following a dual check flight, the student was sent solo for further circuit consolidation. The instructor remained in the vicinity of the apron to observe the student's circuits. The student pilot took off and flew a normal circuit, approach, and landing that was observed by the instructor.

On application of power for the touch and go, the aircraft veered to the left and departed the runway onto the grass, coming to rest approximately 5 metres from the runway edge. During the runway excursion, the aircraft's nose wheel collapsed resulting in the propeller and right wing tip contacting the ground.

The student reported that he touched down normally on the runway but as he applied power to take off again, the aircraft veered to the left. The student applied rudder to attempt to keep straight on the runway centreline, but directional control was not regained, resulting in the aircraft vacating the runway onto the grass.

The operator determined that the student pilot most likely failed to apply sufficient right rudder on the takeoff roll when full power was applied.

It appears that the student may have panicked as the aircraft began to veer from the centreline and failed to close the throttle which could have prevented the situation from escalating.

Following the accident, the student has received a ground briefing on the importance of maintaining directional control of the aircraft while on the runway and has also undergone further dual training.

CAA Occurrence Ref 15/5371

# GA Defects

GA Defect Reports relate only to aircraft of maximum certificated takeoff weight of 9000 lb (4082 kg) or less. More GA Defect Reports can be seen on the CAA web site, www.caa.govt.nz, "Accidents and Incidents".

*Key to abbreviations:*

**AD** = Airworthiness Directive
**NDT** = non-destructive testing
**P/N** = part number
**SB** = Service Bulletin
**TIS** = time in service
**TSI** = time since installation
**TSO** = time since overhaul
**TTIS** = total time in service

## Eurocopter AS 350 B3

### Bolt

| | |
|---|---|
| Part Model: | AS350 B3 |
| Part Manufacturer: | Airbus helicopters |
| Part Number: | 22129BC080074L |
| ATA Chapter: | 6500 |
| TTIS Hours: | 515.85 |

During a tail rotor pitch change assembly re-installation after an unscheduled tail rotor spider repair, the second outboard pitch change link bolt to be torqued via the bolt head (to the value as listed in Airbus Helicopters AMM 65-21-00,4-12), was found broken just under the nut.

The bolt listed for the outboard P/C Link attachment location is a "BC" bolt instead of a "BE", (high tensile bolt), considering the high torque of 283 in/lb required by the manual. The bolt is required to be torqued by the head. Torque wrench calibration checked against another calibrated torque wrench was satisfactory. Both outboard Pitch Link attach bolts were replaced with new ones, and torqued and locked successfully.

CAA Occurrence Ref 15/906

## Piper PA-31-350

### Air Intake

| | |
|---|---|
| ATA Chapter: | 7100 |

After takeoff from Nelson on a visual departure, the right MAP reduced by 3 inches and the EGT reduced to the bottom of the scale, accompanied by slight surging. The pilot re-circuited and landed safely.

Maintenance investigation found that the air intake duct flexible coupling that attached the inlet duct elbow to the turbo charger had become dislodged, resulting in a loss of engine efficiency.

It was apparent that the duct had become contaminated with oil where it was clamped to the turbo charger intake, which then provided insufficient friction for it to remain in place even though the clamp was tightened sufficiently.

Duct cleaned of contamination and refitted, aircraft returned to service.

As a preventative measure following the occurrence, the operator has replaced the flexible couplings with new items.

CAA Occurrence Ref 15/474

## Cessna U206G

### Tailplane fuselage bulkhead fitting

| | |
|---|---|
| Part Model: | 206 |
| Part Manufacturer: | Cessna |
| ATA Chapter: | 2740 |

During SIDs inspection and incorporation of Cessna Modification Kit SK210-126 that involves replacing the forward mountings of the tailplane to the fuselage bulkhead, both forward fuselage fittings were found to have the top two rivets sheared.

An easy way to ascertain if these upper two rivets are sheared, with the aircraft in service, is to attempt to slide a .003" feeler gauge between the spar and the mounting. If the feeler goes in then the rivets have sheared.

The maintenance provider provided the following information:

This failure has been caused by the fact that the distance between the forward and aft mountings of the tailplane are shorter than the mounting points on the fuselage, resulting in tension being set up between the tailplane front and rear spars.

Vibration during operation has caused:

1. The two upper rivets to fail on both mountings
2. The forward fuselage tailplane mounting bulkhead to crack
3. The LH aft outer fuselage tailplane mount structure reinforcement to crack
4. The horizontal diaphragm between the two bulkheads mounting the tailplane to the fuselage to crack at the aft end.

Cessna modification kit SK210-126 contains various shim discs to be installed between the forward mount and the fuselage bulkhead to alleviate the condition of placing the tailplane spars under tension.

However the Cessna service manual for the airframe does not mention shimming of the forward mountings when installing the tailplane, nor are these shims listed in the spare parts manual, latest issue.

CAA Occurrence Ref 15/2529

## Pacific Aerospace Cresco 08-600

### Tail-plane Attachment

| | |
|---|---|
| ATA Chapter: | 5550 |

The pilot reported feeling buffet from the rear of the aircraft when in a steep turn to the right with no payload on board.

Maintenance investigation found that the forward right-hand tailplane attachment was loose. The castle-nut had released its tension on the shear-stud through normal and expected wear and tear within the attachment holes. Replaced attachment castle-nut with a nylex nut and fitted additional washer at the cup washer to allow correct re-tightening of the tailplane skin to the shear bolt plate.

CAA Occurrence Ref 15/3156

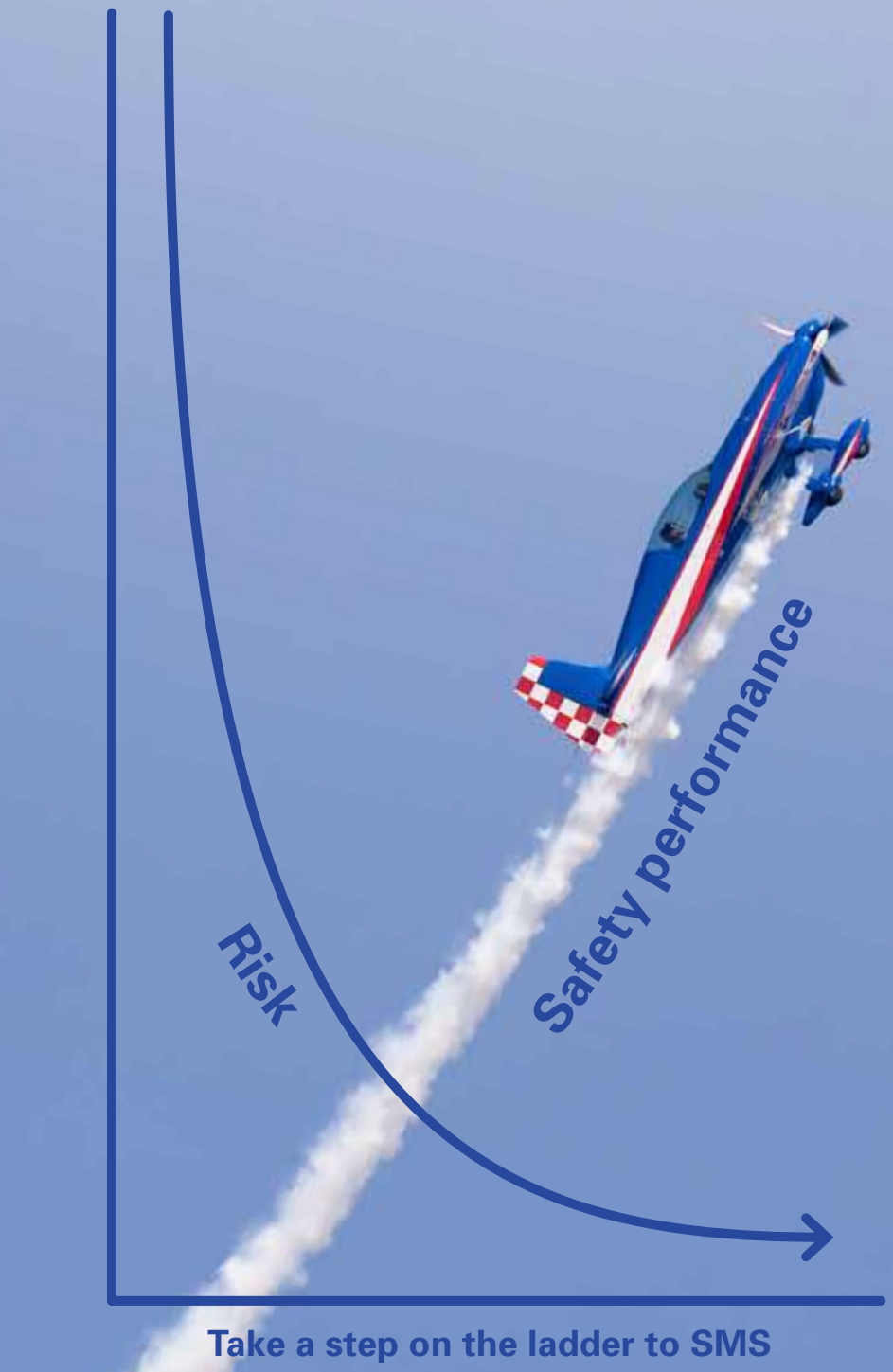
# **Aviation Safety Coordinator** Course

## Taupo

**7 to 8 July 2016**

Suncourt Hotel &
Conference Centre

14 Northcroft Street, Taupo




The number one function of any company is business success – safety is critical to business success.

If your organisation operates commuter services, general aviation scenic operations, flight training, sport aviation, or engineering, you need an Aviation Safety Coordinator.

Attend this free two-day course to understand the role of a safety coordinator, or for those who are already in a safety role, to refresh your skills:

- you will get comprehensive guidance material;
- access to all the latest CAA safety resources and support; and
- lunch is provided (accommodation, transport and other meals are not provided).

AV KIWI SAFETY SEMINARS

# What happened here?

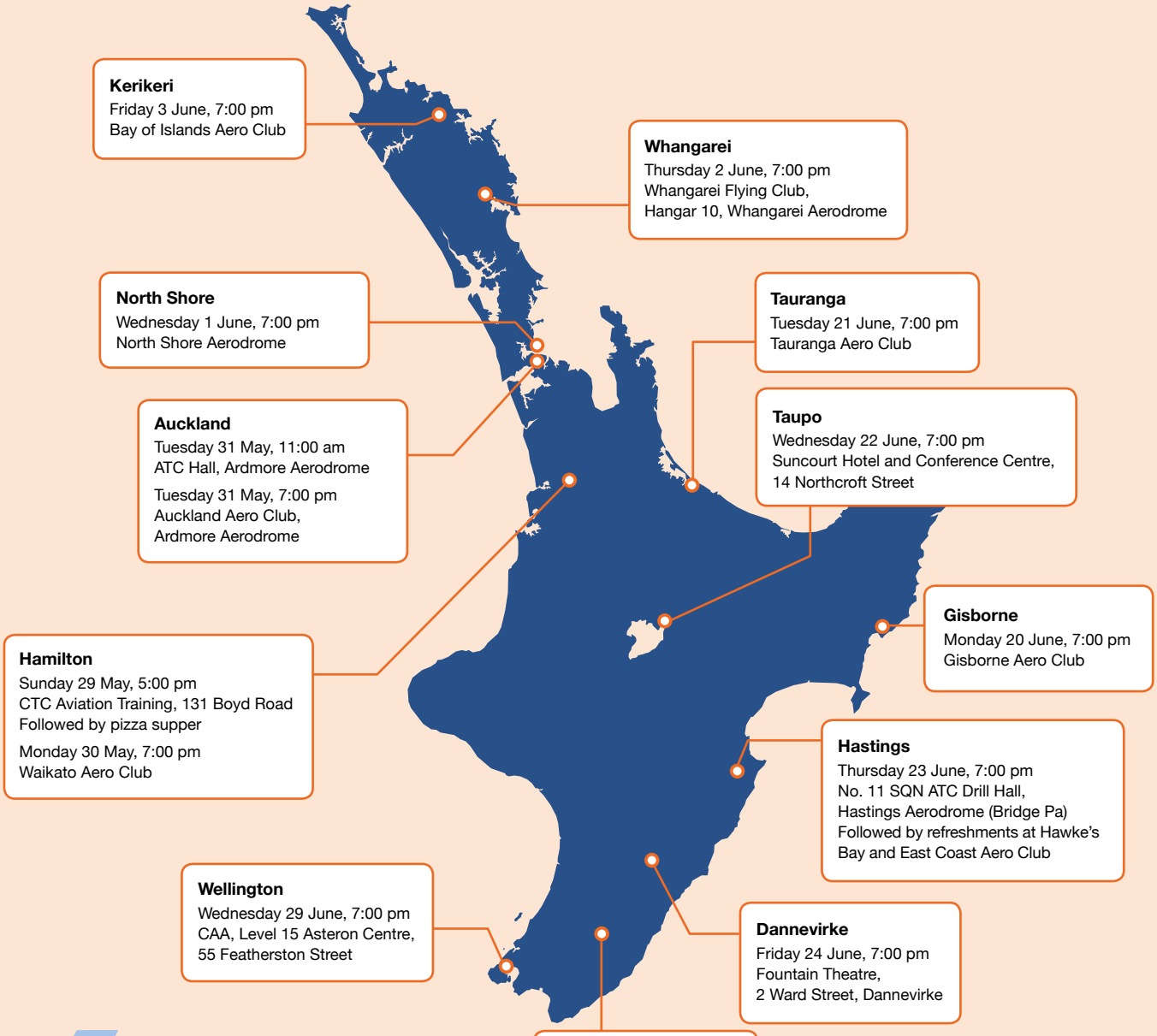
## Sifting the lessons from the wreckage

A wise person once said, “mistakes are lessons”. That is never more true than in aviation.

Through accident investigation, the CAA and TAIC sift the causes of aircraft accidents and incidents. There are no new accidents – learn from those who have flown the paths before you.

This year’s AvKiwi Safety Seminar looks at selected accidents and incidents that highlight the importance of having a sound ‘plan B’ and evaluating it; knowing your aircraft; the fatal consequences of commercial pressures; and whatever happens, keep flying the aircraft.

**AvKiwi Safety Seminars are free to attend and you don’t need to book.**
**For more information, see www.caa.govt.nz/avkiwi.**

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