Pointing to Safer Aviation

Summer 2018/19

vector

Anticipate and integrate at North Shore

Aerodrome markings 101

Carbon monoxide poisoning

HOW TO BUILD A GREAT REPORTING CULTURE

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

// ANTICIPATE AND INTEGRATE AT NORTH SHORE

// AERODROME MARKINGS 101

// CARBON MONOXIDE POISONING

Cover: See the article on page 16. Photo courtesy of Gregg Barraclough for Skydiving Kiwis

// HOW TO BUILD A GREAT REPORTING CULTURE

In this issue...

vector

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From the Director

Whether it's spraying crops of potatoes and brassica, or spreading fertiliser, this is a busy time of year for those involved in agricultural aviation.

Agricultural aviation involves many hazards at any time, but the risk increases in this busy season. When you get busy, it's really important to remind yourself about what you need to do to keep safe at work.

Knowing the area, or just being aware of the general hazards involved in agricultural aviation, is not enough – it's crucial to systematically identify and assess all the possible hazards of a job. You need to have a clear and realistic picture of the associated risks, as well as the current task. Carrying out a hazard identification exercise, and a reconnaissance flight, will enable you to develop a safe and reliable work plan.

Fly to the plan and if circumstances change, make sure the plan does too.

Make sure both you and your aircraft work within limits. For the aircraft, manage the loads properly and keep an eye on the prevailing conditions. Be aware of the effects of fatigue and if necessary, take a break. Keep hydrated.

This is the last issue of *Vector* for 2018 and the last bi-monthly issue. From next year, *Vector* will be published quarterly – less often, but of the same high quality. *Vector* is an extremely important part, but not the only part, of the Authority's safety promotion work. Reducing the frequency of this magazine will enable the team to put their boundless energy and well-honed skills into other activities to spread the aviation safety message.

Regards

Graeme Harris

HONOURING EXCELLENCE IN FLYING INSTRUCTION

Nominations are being called for the Greg Vujcich Memorial Award which recognises excellence in aviation instruction.

Greg was a much loved and respected Air New Zealand flight instructor who died suddenly in 2007.

The award recognises an individual or individuals who've made an exceptional contribution to flying instruction.

That may be due to a single act which significantly advanced instructional technique, or to excellence in instructional technique over a significant period of time.

Although the award is sponsored by the pilots' and air traffic controllers' union, NZALPA, your nominee doesn't have to be a member.

To nominate someone, email medical@nzalpa.org.nz. Or post your nomination to, Medical and Welfare Director, NZALPA, PO Box 53183, Auckland Airport 2150.

Nominations close 1 March 2019.

SAFETY MESSAGE

SECURE LOOSE ITEMS

Helicopter pilots and crews should make sure that all items in the cabin are securely stowed before take-off.

Check the ground around the helicopter for forgotten items and debris. Even if operating with all doors fitted, a loose object can escape through a window or vent.

A number of accidents and incidents have been caused by loose items exiting the helicopter and contacting the tail rotor. The result has been a complete loss of control in some cases.

Brief your passengers about the dangers of loose items in and around the helicopter.

MAINTENANCE CONTROL FOR PART 135 AND 125

The role of the maintenance controller in a certificated organisation is vital for the economic wellbeing of the organisation as well as for safety and compliance.

The term 'maintenance controller' doesn't appear in the rules, but organisations certificated under Part 119 must have a "senior person responsible for the control and scheduling of maintenance". That person is commonly called the maintenance controller.

So, what *is* the role?

The maintenance controller holds responsibility on behalf of the operator for airworthiness of their aircraft. This includes the equipment fitted to the aircraft. The maintenance controller should be fully involved in the day-to-day management of airworthiness.

That ranges from knowing the configuration and modification state of every aircraft to assessing service information and airworthiness directives (ADs), development and upkeep of maintenance programmes, and the scheduling and planning of maintenance.

Sean Coleman from Heli Assist says the most basic obligation of a maintenance controller is to ensure maintenance is carried out in accordance with the operator's exposition.

"The operator relies on me to plan for upcoming maintenance to reduce unnecessary downtime, ensure availability of scheduled replacement parts, and to ensure maintenance has been carried out and documented correctly – but also, all of this in accordance with the exposition."

Brett Richmond from Fieldair Engineering says maintenance control is a niche and central position in an organisation, and needs time and good organisation.

"You're providing forecasts to management, describing the impact of upcoming maintenance – both financial and in down time – how you can streamline that, and make it more efficient. You're dealing with the operations manager and chief pilot, both of whom have their own timetables. You're having regular planning meetings so everyone is on the same page."

CAA Aviation Safety Advisor John Keyzer says technical knowledge is a must, as well as the time commitment.

"Apart from knowing the operator's exposition backwards, a maintenance controller needs to understand the aircraft, their systems, their configuration and their modifications. They have to have a very good understanding of the manufacturer's instructions for continued airworthiness. They need to have a working knowledge of the manufacturer's technical data. They have to be completely familiar with the maintenance rules."

Photo: istockphoto.com/Evgeniy Shkolenko

// A positive relationship with the maintenance provider is key to success in the role.

Before any maintenance takes place, the maintenance controller must supply a detailed description of the work to be completed. This ensures that any work carried out is fully planned, including sourcing all requirements, such as parts and data.

It also ensures that any operator requirements for returning the aircraft to service – operational flight checks for example – can be managed.

// If the maintenance controller gets it wrong, the ripple effects through the whole organisation are huge. //

"You have to really want to do the job," Brett Richmond says. "There's no point press-ganging someone into the job. It's a really important role and it needs to be done properly. If the maintenance controller gets it wrong, the ripple effects through the whole organisation are huge."

A lack of time or commitment to the role, or forgetting which 'hat' is worn during which task, has led to one or more of the following:

- incomplete or inaccurate airworthiness and maintenance records;
- maintenance based on an aircraft's latest review of airworthiness, with earlier airworthiness requirements being missed;
- no proper check on the validity of a previous maintenance programme as an aircraft is moved from that, to another programme;
- failure to properly review that requested maintenance has been carried out before a release-to-service;
- airworthiness directives being recorded at the time of the review of airworthiness, rather than at the time of their 'effective dates'. »

Distinct roles

In many cases, an operator will contract out their maintenance. This is when the role of the maintenance controller is crucial, but it gets more complicated if the maintenance controller is remote from the operator's base.

The operator must realise they hold responsibility for ensuring the safe operation and continuing airworthiness of their aircraft.

There's a helpful list of responsibilities in AC119-1, see Appendix B – *Subcontracting Maintenance*.

This list is a useful reminder of your responsibilities even if you don't contract out.

Qualifications and experience

The qualifications and experience requirements for the senior person role are detailed in Part 119, Appendices A and B.

The level of experience required varies with the type and number of aircraft and bases operated.

Value beyond safety

The value to an operator of a competent maintenance controller can be measured, not just in safety, but also in reputation and profitability.

Sean Coleman says ineffective maintenance controllers have actually cost operators money because of incorrect records, incorrect service life limits, or overhaul intervals, which have resulted in parts having to be replaced.

"I've known a case where an aircraft has had to go back to the provider for maintenance a few weeks after being inspected, because there was no proper forward planning about inspections. All of that has cost the operator money and unnecessary down time."

John Keyzer says robust maintenance control is a really valuable business tool, even for the private operator.

"If you don't know what needs to be done, and you don't know how long it's going to take, and you don't know how much it's going to cost, you'll in no way be ready to pay for that maintenance."

A competent maintenance controller straddles safety and business accounting.

"Let's say an operator has an arrangement with their maintenance provider to supply their own parts, but, because they have no real oversight of the maintenance, they're not aware XYZ needs replacing," says John.

"So they don't order the part, and when they do, there's a 90-day wait, and the maintenance needs to be done in 30 days' time.

"So that's unscheduled, and expensive, downtime."

Photo courtesy of Oceania Aviation.

// Behind every pilot, there's an engineer who's worked to make sure their aircraft is safe to fly. Behind both of them, there's a maintenance controller making sure the right maintenance on that aircraft was done at the right time, and according to the rules.

SHARING YOUR VIEW OF THE WEATHER

Pilot reports are invaluable to meteorologists and other pilots – whether they're about the presence of volcanic ash, an encounter with severe turbulence, or aircraft icing.

// Satellite image taken by NOAA's polar orbiting Aqua satellite at 0220 UTC on 27 July 2018. Ash is seen spewing from the volcano Aoba on Ambae Island, Vanuatu, while ash from an eruption of Aoba earlier that day is moving across Fiji.

Pilot reports help meteorologists refine their current warnings and improve future ones. They also ensure other aircraft are aware of hazardous weather in the area.

Under *AIP New Zealand* GEN 3.5, all aircraft are required to provide air reports or pilot reports (known as AIREP Specials or PIREPs) whenever the following meteorological conditions are encountered or observed:

- moderate or severe turbulence;
- moderate or severe icing;
- severe mountain wave;
- thunderstorms, with or without hail, that are obscured, embedded, widespread, or in squall lines;
- heavy dust storm or heavy sandstorm;
- volcanic ash cloud;
- pre-eruption volcanic activity or a volcanic eruption.

It all goes towards improving the shared view of current and future weather phenomena both locally and globally.

Aoba eruption

On 26 July 2018, an eruption of Aoba, the volcano on the Vanuatu island of Ambae, sent ash over 6 km high into the atmosphere. A series of lightning storms were initiated by the eruption. These gave the meteorologists at the Wellington Volcanic Ash Advisory Centre (VAAC) the first clue that something out of the ordinary was happening.

Checking the satellite imagery over the region, the VAAC meteorologists were quickly aware this was a big eruption. Ash had reached the strong westerly winds high in the atmosphere and was heading towards Fiji airspace during peak tourism season.

Thankfully for the meteorologists, it was a relatively clear day over Vanuatu and across to Fiji. This meant a clear satellite view of the ash cloud horizontally and by comparing the satellite derived temperature of the ash with a nearby weather balloon sounding, they also had a good idea of the cloud top height. What they were missing, however, were observations of the ash cloud base as it moved towards Fiji.

If this eruption had occurred across Western Europe, a scattering of LIDARs[1] would have given local VAAC meteorologists a series of cloud base measurements. But across the South Pacific, meteorologists must rely on ash dispersion models, experience – and if they're lucky – pilot reports.

Around 12 hours after the initial eruption, the ash cloud was moving across Fiji. Meteorologists had estimated the base of the cloud to be around 10,000 ft, based on the balloon sounding and the direction the ash was moving. By working closely with the local international operator, Fiji Airways, VAAC was able to confirm their cloud base estimate using a range of observations provided by various Fiji Airways flights. This meant the meteorologists had higher confidence in their forecast and so did Fiji Airways, who managed to continue operations by flying under the ash cloud.

1 LIDAR stands for Light Detection and Ranging. It's a remote sensing method using a pulsed laser to measure distances of objects from Earth.

I learned about flying from that //

HEALTH MATTERS

When Geoff van Asch lost his medical in 2013, he became absolutely focussed on improving his health and getting his Class 2 back.

//

In early 2012, Blenheim accountant Geoff van Asch had a blood pressure test.

The result was 120/80, just about perfect. He was a keen cyclist, biking 50 km trips, and although by his own assessment, he was "big – 125 kg" he was not unfit.

Fifteen months later, at Omaka, Geoff – a Murphy Rebel and Piper Cub pilot – had a medical check with Healthy Bastards campaigner Dr Dave Baldwin.

"My blood pressure was through the roof – 188/120. I hadn't felt any different so it was a complete shock."

Dave refused to renew his Class 2 medical. But Geoff, in his own words, is "a determined bugger".

"I decided I had major reasons to live – a wife, two children, and an aircraft I was just finishing building.

"So instead of sitting around complaining about my bad luck and the CAA, I decided to claw my way back to a clean Class 2."

Geoff made changes to his lifestyle – "not too much alcohol, not too much sugar, plenty of green stuff" – and he put himself in the hands of a "health guru from Christchurch".

Two years later, he was 20kg lighter, with a BP of "122ish over 76ish", off all medication, and with his Class 2 well and truly restored. He was almost literally a new man.

Writing in the AOPA magazine, *Approach*, Geoff said, "Losing my medical focused my attention and forced me to consider my future. I lost a very close acquaintance in his early 50s with a heart event..." (Summer 2015)

"Geoff is an awesome case," says Dave Baldwin. "He was one big unit when his blood pressure was spiking. Now he looks a bit like Sonny Bill!"

Dave embarked on his Healthy Bastards campaign because he "got sick of going to the morgue to sign off people like Geoff.

Photo: istockphoto.com/sturti

"I was thinking, 'what more could I have done to prevent this happening?' It was doing my head in, a bit. So I started the campaign to get those health messages out."

Dave says the greatest gift anybody is given is their body.

"Often you don't realise how important it is until it starts to let you down.

"For goodness sake, if you think you might be developing a health issue, check it out with the GP."

Dave recommends that pilots make the most of their physical.

"You're already at the GP getting a medical check, so load it up! It shouldn't cost any more to have a few specific things checked out.

"For instance, if you're an over-50 male, it's time to talk about your prostate. If there's bowel cancer or high cholesterol in the family genes, talk to the doctor about that. Get a skin check for strange-looking moles.

"It will reassure you you're on the right side of healthy. And if something is picked up early, you've got a better chance of recovery."

Dave says he also encourages pilots, who fly as a career, to get insurance.

"Pilots need to think about what would happen if they lost their medical, or had a heart attack, or a car accident. If they then had some trouble with ACC, they need to consider if they would be covered so they could feed their family.

"If they're covered, there's no problem exploring things with their GP that might be worrying them, and no worries about letting the CAA know."

Licence holders are legally required to advise the CAA if they're aware of, or suspect, a change in their medical condition that may interfere with aviation safety. GPs and operators have the same legal obligation.

Operators who are reluctant to report their suspicions about an employee's medical status to the CAA should ask themselves if they would be happy having their family fly with that pilot.

Geoff van Asch, who says his new philosophy is 'you are what you eat – and what you do' says he has a checkup every year on his birthday.

"Having my Class 2 pulled did kick me in the arse. It was a real wake-up call. To be honest, it probably saved my life."

// FLYING AND LYING (TO YOURSELF)

While an episode of pilot incapacitation is rare, it can be catastrophic, particularly during single-pilot flights.

According to recent research from Australia, 70 percent of pilot incapacitation in low capacity air transport and general aviation results in a return to the departure aerodrome, or even collision with terrain.

The AvKiwi Safety Seminar 'Personal Preflight' says, "Before you fly you always preflight your aircraft, but how often do you preflight yourself?

"All too often we hear ourselves, and others, say 'I'll be right.'

"Well sometimes you won't be.

"It's important to make sure you are fit to fly, both mentally and physically. When you get into your aircraft there's a lot riding on your ability to perform well, when things are going well – and when they aren't."

So don't fool yourself, and check off your personal fitness as carefully as you check off the fitness of your aircraft.

That means thinking about how tired you might be, whether you remain affected by alcohol and other drugs from a few hours before, what your stress level may do to your decision-making, and whether you're sufficiently fed and watered.

Consciously evaluate your general wellbeing, and identify the risks of you flying that day and thoroughly consider how you will manage them.

Be brutally honest with yourself.

// FLYING AND LYING (TO THE CAA)

Apart from the safety and legal reasons the CAA wants to know if a medical condition is likely to threaten safe flying, Dave Baldwin says there's a further incentive for pilots to always be open with the CAA about their health.

"I've been to a few inquests in my time. Believe me, you do not want to have had an accident, and then the lawyers find out you've also got an undisclosed medical condition – even if the medical condition had nothing to do with the accident. You lose all credibility."

ANTICIPATE AND INTEGRATE AT NORTH SHORE

Understanding the needs of others at a busy mixed-use aerodrome like North Shore will go a long way to keeping you and others safe.

North Shore aerodrome has flight training schools for both fixed-wing aircraft and helicopters, small airline operations going in and out, and there's a lot of private flying too.

North Shore Aero Club is the aerodrome owner and the biggest operator there, doing a lot of training.

Chief Flying Instructor Daryl Gillett says a major issue is people not complying with the circuit pattern, despite constant reminders.

"For example, joining right downwind or right base when it's a left-hand circuit. Or aircraft doing right-hand turns into a left-hand circuit, which conflicts with existing traffic."

Daryl says it makes a mockery of the standard procedures published in the AIP.

"It means that particularly junior pilots, student pilots – they don't know what the heck's going on. They are expecting to see aircraft in particular places and they don't because the aircraft is joining however they want, or vacating as well, for that matter."

He says just calling 'non-standard' does NOT absolve pilots of compliance with the rules.

"Part 91 is pretty specific, the AIP is pretty specific and obviously all the procedures are promulgated on the plate as well."

He says it's more often itinerant pilots who don't comply, which can create havoc at such a busy aerodrome.

Roy Crane, the CEO of North Shore Helicopter Training, agrees.

"Sometimes aircraft, especially helicopters, will come in and do their thing and will do a right turn on a left-hand circuit.

"Just stick to the standard joining procedures, then everyone knows where they should be," says Roy.

Daryl says helicopter and fixed-wing pilots need to be aware that they need to integrate.

He says the aerodrome is pretty unique.

"At bigger aerodromes like Ardmore, the helicopter and fixed-wing aircraft are pretty segregated, the circuit patterns are really separate. But at North Shore we have to integrate into the same circuit pattern, albeit with helicopters at a slightly lower altitude."

Daryl says there are also wake turbulence considerations.

"If you've got a helicopter using the same runway, particularly in light wind conditions where the wake doesn't get blown away as readily, it can be a real issue for a fixed-wing aircraft approaching from behind.

"Helicopters often hover just off the side of the runway too; a big rescue helicopter, for example, producing a massive amount of wake turbulence can be a real danger."

Roy Crane has been flying in and out of North Shore aerodrome for 17 years.

He says as a busy helicopter training company, they have to work in with the equally busy fixed-wing school.

"We co-exist well together because we have a really good working relationship."

He says understanding what each other is doing is the key.

"For example, fixed-wing aircraft do glide approaches, while we do autorotations. If visitors come in and don't understand what we're doing, there's potential for confusion."

His company, which also flies commercially, tries to steer clear of the main vector.

"We join in on the crosswind runway and stay clear of the main 21/03 just so we can try and come in underneath the fixed-wing guys."

Roy says helicopter pilots also need the understanding of fixed-wing pilots.

"They maintain speed as they come in to land, whereas helicopters slow down. What can happen is that fixed-wing guys can get frustrated because we're taking longer on finals.

"We are entitled to use the runway so fixed-wing guys need to be patient and not get too close behind us. The best thing they can do is increase their separation between us so the runway is clear for when they want to come in and land."

He says pilots need to identify where each other is in the circuit.

"It's just trying to segue ourselves in between each other."

Daryl Williamson is Barrier Air's Chief Pilot and has been flying in and out of North Shore for various companies for the last 12 years.

He says when it's busy, there can be three or four fixed wings doing touch and goes.

"Joining can be quite a challenge sometimes, just trying to slot in with a whole mixture of traffic all flying at different speeds."

Daryl says that's exacerbated by a wide range of aircraft with varying capabilities.

"Everything from slow home-builts to higher performance aircraft and the different range of abilities. It's a training venue.

"Helicopters do a lot of hover taxiing on the cross vector as well so there are considerations there with spacing."

He says see and be seen, and make as many radio calls as necessary.

"Stick to the published procedures because you're very close to the border with Whenuapai, so there's not a lot of movement area outside of the circuit.

"The aero club is good; if you're not familiar with North Shore, give them a call, they are quite happy to help and give you advice."

Photo courtesy of Steve Bicknell.

AERODROME MARKINGS 101

All aerodrome users should be as familiar with aerodrome markings as they are with road markings. Not knowing what they represent could lead to a dangerous situation.

Negotiating the concrete and asphalt maze of taxiways, turnoffs, holding points, and apron areas at aerodromes can be rather confusing.

Ground movement charts for the major aerodromes and a number of provincial aerodromes are provided in *AIP New Zealand*.

Contained in this article are some of the main aerodrome markings you might expect to see while operating in New Zealand.

Details of New Zealand standards for runway, taxiway, and apron markings can be found in Advisory Circular AC139-6 *Aerodrome Design Requirements*, Appendices 1 to 3. Although this information is designed for aerodrome operators, it provides useful illustrations for pilots.

Runway markings

All runway surface markings are painted white, sometimes edged with black (on concrete runways to provide better definition). At the intersection of two paved runways, markings on the primary runway only are displayed.

Threshold markings

Threshold markings are provided on all paved runways. They're commonly referred to as 'piano keys'. They're a series of parallel longitudinal stripes (30 m in length) across the width of the runway, starting at a point 6 m from the runway end.

Displaced landing threshold

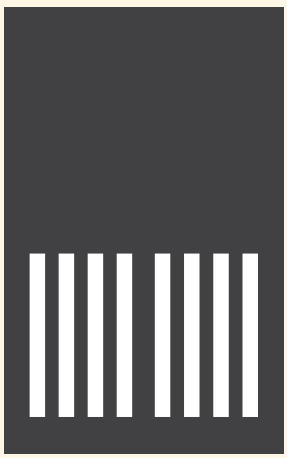
When necessary, the landing threshold will be displaced to a point along the runway where the approach profile will allow an aircraft to clear a particular obstacle. The threshold may be temporarily or permanently displaced. If the obstacle will eventually be removed, then a temporarily displaced threshold is marked either by wing bars, cones, or marker boards placed outside the runway edge. If the obstacle cannot be removed, a permanently displaced threshold is marked by a transverse stripe 6 m before the new threshold marking. Arrows between the paved runway end and the transverse stripe are located at a fixed distance back from the threshold stripes.

Landing aircraft should not touch down before the displaced landing threshold and should be flown across the threshold markings at approximately 50 feet AGL.

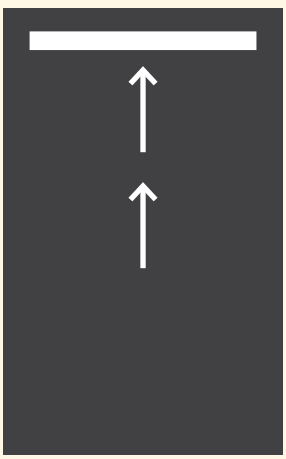
Remember that a displaced landing threshold is not a displaced take-off threshold. It has nothing to do with the point for starting the take-off roll. Failing to use the full take-off distance available could result in the aircraft having inadequate take-off distance available, with reduced obstacle clearance in the climb.

Centreline markings

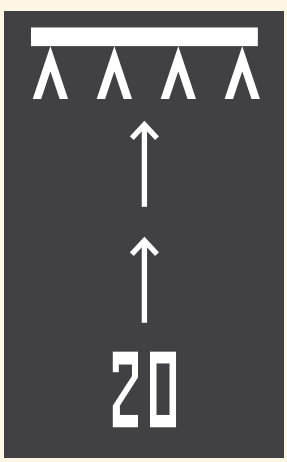
Centreline markings are on each paved runway, starting from the runway designation marking. The centreline is a series of evenly spaced lines and gaps along the centre of the runway throughout its length. 》



// Threshold markings



// Permanently displaced threshold



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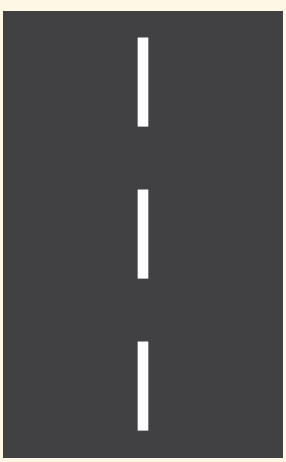
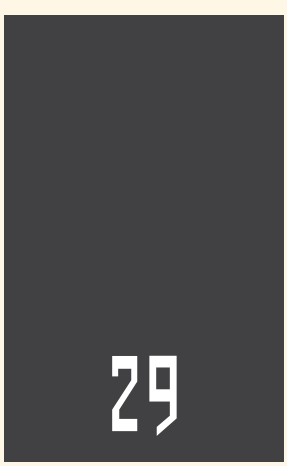
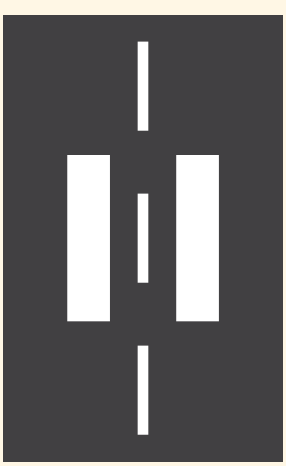


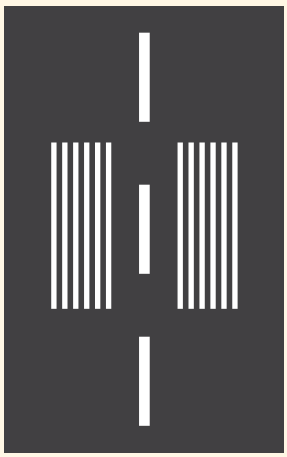
// Centreline markings



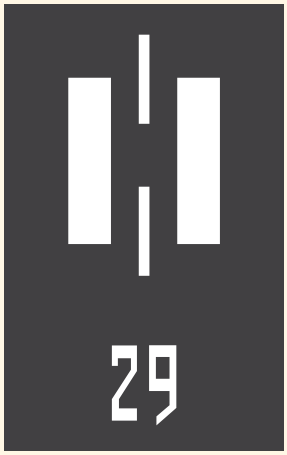
// Runway designation



// Aiming point markers

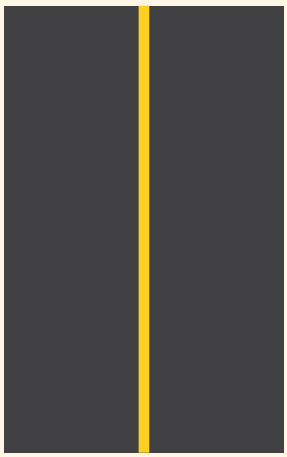


// Fixed distance markers



// Touchdown zone marking

// Touchdown zone limit marking



// Taxiway centreline marking

Runway designation

The runway designation is just beyond the threshold marking of each paved runway. It consists of the first two digits of a magnetic bearing relating to the runway centreline, with those digits rounded. For example, if the runway centreline is 286 degrees magnetic, the runway designation will be Runway 29.

Aiming point markers

Aiming point markers are two rectangular stripes either side of the runway centreline indicating where the aircraft should touch down. Sometimes the rectangular marking consists of a series of stripes to provide maximum skid resistance.

Aiming point markings are provided at each end of a paved instrument runway where the aerodrome reference code number is 2, 3, or 4. They're also provided at each approach end of a paved non-instrument runway where the code number is 3 or 4, and a paved instrument runway where the code number is 1, when additional visibility of the aiming point is sought.

Aerodrome reference code numbers depend on the characteristics of the aeroplane for which an aerodrome facility is intended. For more information about this, see *Part 139 Aerodrome – Certification, Operation and Use*, Appendix B.

Fixed distance markers

Fixed distance markings consist of a rectangular marking on each side of the runway centreline, 300 m from the threshold. Each rectangular marking is composed of a series of thin longitudinal stripes. This is where you should aim to touch down. These markings work on the assumption that you pass over the runway threshold at a height of 50 feet.

Touchdown zone marking

Touchdown zone markings are on runways with instrument approaches, and consist of several pairs of rectangular markings at 150 m intervals from the threshold. They provide reference points for pilots to assess their progress towards the fixed distance markers. The number of pairs varies depending on the landing distance available or the distance between thresholds.

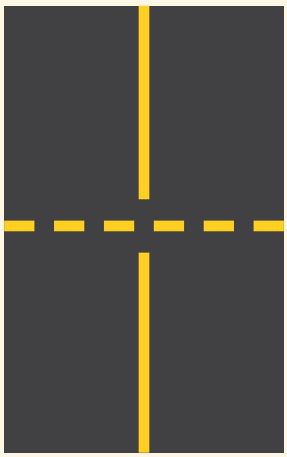
Touchdown zone limit marking

Triangular touchdown zone limit markers are provided at some aerodromes as 'go-around points' for specific types of heavy aircraft that are runway restricted. The marking consists of a series of transverse stripes in a right angle pattern at the runway edges. They are applicable only to those specific aircraft types.

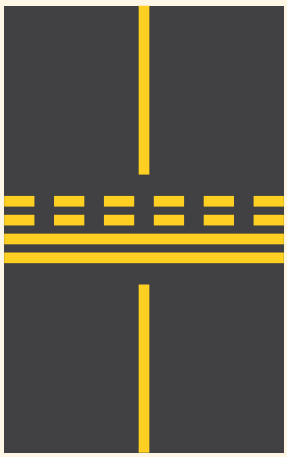
Taxiway and apron markings

Taxiway and apron markings are of a conspicuous colour (yellow) contrasting with the colour used for runway markings. They may also be edged in black to provide better definition.

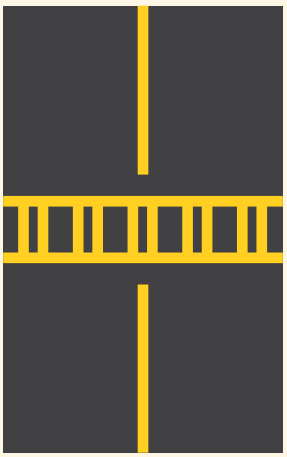
It's also important to be aware of passenger walkway lines, which are solid blue. Where the passenger walkway crosses a vehicle movement lane, a white zebra crossing may be used.



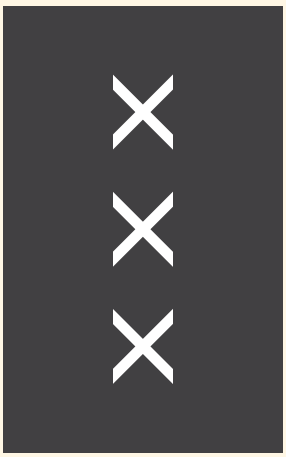
// Intermediate holding position marking



// Runway holding position marking – Pattern A



// Runway holding position marking – Pattern B



// Closed marking

Taxiway centreline marking

A taxiway centreline is a continuous line. On a taxiway curve, the centreline marking will continue from the straight portion(s) of the taxiway at a constant distance from the outside edge of the curve. In the case of large aircraft, it's important that taxiway lines are followed when manoeuvring around the aerodrome, to ensure adequate wing and wheel clearance.

Intermediate holding position marking

An intermediate holding position marking identifies a holding position established to protect a priority route. These markings consist of a single broken line.

Runway holding position marking

A pattern 'A' runway holding position marking is the last holding position before entering a runway. These markings consist of transverse lines across the width of the taxiway. Note that the line nearest the runway is broken and the one on the taxiway side is solid.

A pattern 'B' runway holding position marking identifies a holding point further away from a runway than a pattern 'A' runway holding position marking. A pattern 'B' runway holding position marking has two lines across the runway that are intersected at 90 degrees by small lines. It looks similar to a ladder across the taxiway.

In some domestic aerodromes in New Zealand, the holding position marking may still be a single line with a dashed line closest to the runway.

Aircraft should not proceed beyond a taxiway holding position in the direction of the runway until the pilot is confident the runway and approach are clear; or for a controlled aerodrome, a clearance has been issued by air traffic control.

Closed taxiway or runway markings

Closed marking

If a runway or taxiway (or a portion of either) is closed, crosses near the ends of the closed portion will be painted, or will be formed by white marker boards. The marking will be white on a runway, and yellow on a taxiway.

Marker boards or cones

Marker boards or cones displayed on an aerodrome indicate the safe limits of aircraft movement. Boundary markings should be provided at an aerodrome where the landing area has no defined runway.

They comprise distinctive rectangular boards or pointed cones, coloured white, red, yellow or orange, and they are displayed on the boundaries of the areas concerned.

In situations where an aerodrome has two parallel runways, pilots need to be aware of which runway holding position markings to stop at. Remember that you need to stop the aircraft short of the series of the lines where the closest to you is solid, and the furthest away is broken.

Further information

For more information on aerodromes and aerodrome markings, including Advisory Circular AC139-6 *Aerodrome Design Requirements*, visit www.caa.govt.nz/aerodromes.

See the September/October 2018 issue of *Vector* to read Aerodrome Signs 101.

HOW TO BUILD A GREAT REPORTING CULTURE

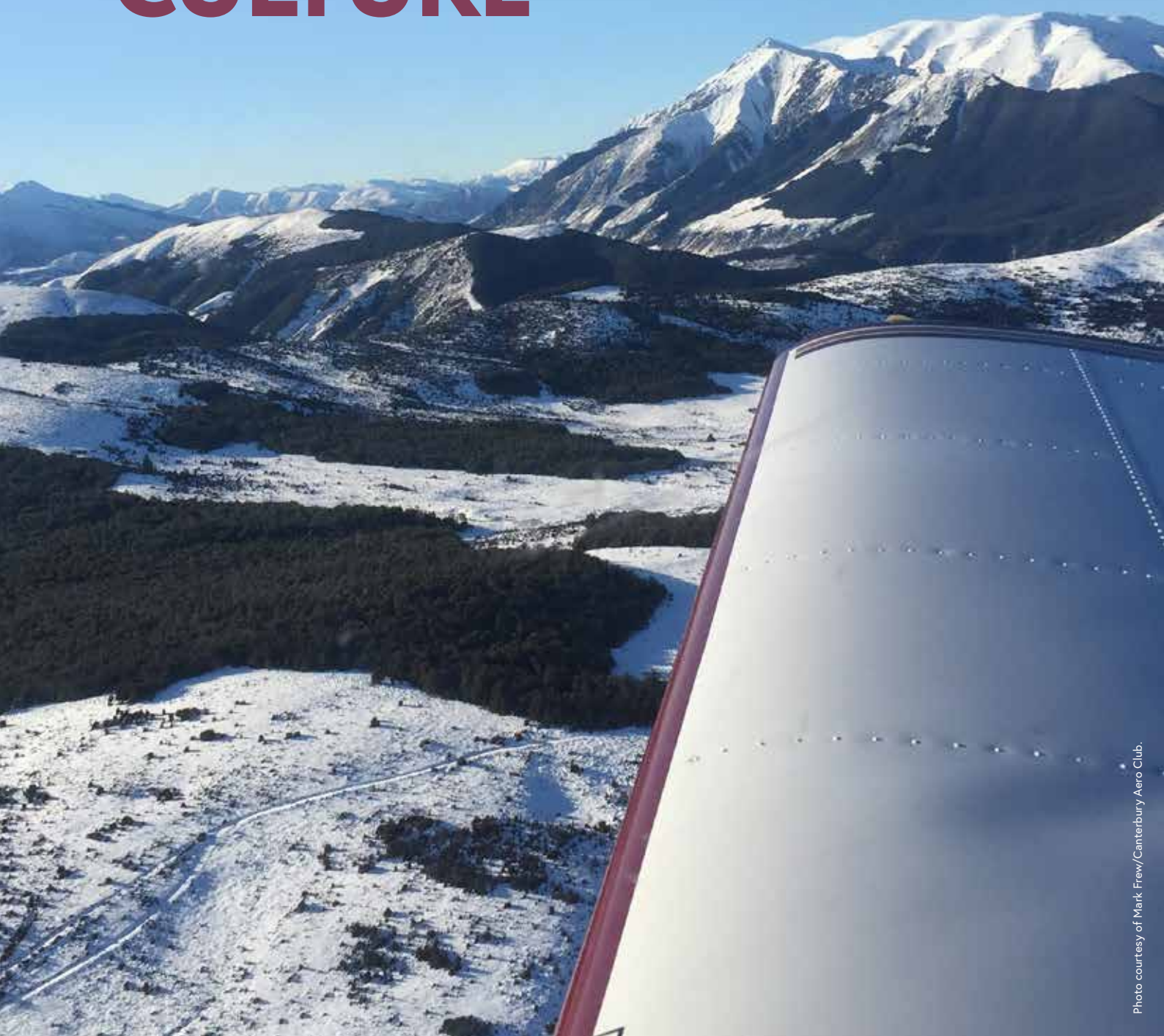


Photo courtesy of Mark Frew/Canterbury Aero Club.

As part of establishing their Safety Management System, the Canterbury Aero Club built a robust reporting culture in 18 months. Here, they – and other operators – explain what's important to encourage reporting.

How do you persuade pilots – who're perhaps reluctant to report a mistake and expose themselves to ridicule – to report an occurrence?

Jeremy Ford, the CEO of Canterbury Aero Club, says you start with yourself.

"Leading from the front means you have to have the right mentality yourself. Only then can you instil the culture needed to deliver the level of safety you're looking for."

Jeremy built on the work of the previous chief executive in transforming the reporting culture at Canterbury, knowing that to have an effective Safety Management System (SMS), he had to encourage reporting.

"We wanted to change the attitude that occurrences were something you just tried to forget had happened, to things that were opportunities to learn, to contribute to future safety.

"We emphasised that reporting would help us fix the system that had allowed the occurrence to happen in the first place."

Jeremy says members of the aero club, and students at the club's international aviation academy, were assured any reports could be done with complete anonymity.

"I have no idea who has submitted a report. Sometimes I'll put the word out that I'd like to talk to the 'reporter' and sometimes they will come and have a chat. Sometimes they won't – and we honour that. We don't push."

// At Canterbury Aero Club, occurrences became opportunities to learn more about safety.

Words matter

Jeremy and his safety systems manager, Stephanie Schwabe, also reassured hesitant aero club members and academy students their occurrence would not be treated as a 'breach' of anything.

"Words are important, so we renamed the 'Problem Report' the 'Occurrence and Improvement Report' reflecting the emphasis on improving safety."

Such encouragement of reporting can, at the start, lead to an embarrassment of riches.

Stephanie says as the reporting culture takes hold, there can be some fairly trivial ones.

"Nevertheless, people who report have to see their occurrence is being investigated and they want to know what happens as a result.

"The first time you don't bother to examine an event is the point at which you lose their engagement.

"Once things settle down, people get a better idea of what is reportable. You start to get some really good data." »

// BUILDING REPORTING

- Make it easy to report.
- Apply just culture principles.
- Encourage open reporting (with the option of anonymity to reassure reluctant reporters).
- Investigate every report.
- Keep the emphasis on what can be learned.
- Make it clear what happened as a result of the report.

Stephanie says the 18-month period in which it took to improve reporting reflects the longest course the academy provides.

"So the students were taking on the reporting culture, the instructors were taking on the reporting culture, and they were taking that next door to the aero club.

"The turnover in staff in that 18 months also contributed, because we had an intake of new employees who'd only ever experienced a strong reporting culture."

The role of just culture

Shaun Seddon, the deputy SMS manager at the International Commercial Pilot Academy in Whanganui, describes what happened when students came face-to-face with a just culture.

"Student representatives attend our regular safety meetings. At one, they told us about an occurrence that sounded pretty hair-raising, that hadn't been reported formally. They'd just heard about it from other students.

"We called a students' meeting and said there'd be no flying until a formal report had been logged.

"But we also said no one would be in trouble; we just had to get the details on what happened so we could make sure it didn't happen again. We talked a lot about 'just culture' principles.

"The next day, the formal report was logged – and so were a few others. They didn't get in trouble, as we promised. We went from about five reports a month to about 30.

"As it turned out, the original story had become embellished as it had gone round the students. When we investigated the circumstances described in the formal report, we realised there was no real risk at all.

"The more important thing was that it gave us an opportunity to reassure the students they would not be in hot water if they reported."

Shaun says there's another reason for the increased rate of reporting.

"The students are keen to see trends in occurrences. We were able to explain the direct link between reporting and being able to identify trends.

"So they were keen to be a part of that as well."

Pearce Bennett, Chief Pilot of Skydiving Kiwis in Ashburton, believes the younger generation of participants may be more at home with regular reporting than the older generation.

"I think the introduction of just culture principles, recognising that humans will make mistakes, has meant a change in attitude," Pearce says.

// JUST CULTURE PRINCIPLES

- Workers are encouraged, even rewarded, for providing essential safety-related information.
- Disciplining human error is inappropriate and counter-productive to reporting.
- Safety failures and incidents are used as lessons to avoid more serious events.
- Workers are clear about where the line is drawn between blameless mistakes, and negligent, reckless, repeated, and/or intentionally wilful unsafe acts.

"These days, everyone is far more interested in information-gathering and education, than in penalising someone for a mistake anyone could make."

It's generally accepted that leading up to a major occurrence there are about 400 minor ones.

"So you deal with those minor ones so they don't get a chance to become the major one," says Pearce.

As an example, he describes a recent report from a tandem master.

"He opened his parachute and found one of the brake lines wasn't correctly stowed; it came loose after the parachute was deployed.

"So he reported it, no big deal, and it was just, 'oh sweet, we can deal with that'. We were training a new packer so we just gave them a bit more guidance, particularly about maintaining vigilance, and now it's all good."

Involving the staff

Miriam Stevenson, CEO of Skywork Helicopters in north Auckland, says having the reporter involved in developing the solution has also been successful in building a healthy reporting system.

"It's great if the reporter, not management, comes up with the solution. If they're experienced, they know what better option they could have taken. If they're inexperienced, it might take a bit of help to come to a viable solution.

"It's important they don't feel like they report, then go about their business, and management will decide what to do."

Miriam says reported incidents and near misses are also treated as learning opportunities for everyone, and solutions are often generated through a team approach.

"That approach means everyone gets the one message, and it helps them feel like they 'own' the issue, the answer, and the responsibility to act, so it doesn't crop up again.

"We have a very co-operative organisation – no management versus workers thing – and everybody gets involved in safety and the reporting process.

"It varies between people as to how much they report. But we have built an environment where reporting is done more and more.

"That's not to say nothing is ever disciplined. If someone is indicating they don't care what they could have done to themselves or others, or what they cost the company, then yes, that's disciplined.

"But usually we have the 'good conversation' first – before it ever gets to that point."

Reporting to the CAA

Some participants who've reported to the CAA in the past have complained they never know what happens to their report.

The managers of Intelligence, Safety and Risk Analysis (ISRA), and Safety Investigation both look at every report – all 8000-odd of them, every year!

In the March/April 2017 issue of *Vector*, ISRA's manager, Jack Stanton, said this:

"We really appreciate that reporting is increasing. Eighty percent of our intelligence work is based on reports, and good descriptions are essential to making sense of those reports."

The CAA's analysts pore over the data to identify spikes in types of accidents, say, at a certain time of year, or trends over time.

"I'm aware that some people think their report has fallen in a black hole, because they don't hear much back," says Jack. "But I can assure them every report is looked at, and those that are part of a trend will be valuable to our assessment of risk and safety."

CAA analyst Joe Dewar liaises with the helicopter and adventure aviation sectors to improve the awareness of participants about where risk is concentrated. That work is based on participants' reporting.

Reporting underpins the quarterly and six-monthly safety reports (caa.govt.nz, "Aviation Info > Safety Info > Safety Reports") summarising occurrences in each sector.

The analysts also produce 'mini' safety reports for each sector, improving the understanding of each of the CAA's operational units of where best to concentrate resources.

Reporting enables safety investigators to analyse what contributed and led up to occurrences, combining that information with other safety data, to identify any 'themes' in the occurrences and what they might have in common.

All this valuable information begins with participants' reports.

// REPORTING MYTH

Here's an excerpt from the May/June 2016 *Vector* article, "Just Culture and Reporting", in which the Director described the CAA's attitude to reporting.

"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."

Graeme Harris 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.

"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."

In the two years since that article was published, Graeme has never received such an email.

The easiest way to report an occurrence to the CAA is online, www.caa.govt.nz/report.

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.

THE MANY RESPONSIBILITIES OF AN AIRCRAFT OWNER

It's a dream come true for many, owning your own aircraft. But that dream can turn into a bit of a nightmare if you don't understand your responsibilities.

Beware the lemon

The temptation in buying an aircraft is to focus on what excites – avionics, upholstery, or an impressive cruise speed.

The trap is ignoring what lurks out of sight: corrosion, pending but hidden maintenance tasks, an engine that has sat around for years, or poorly kept maintenance records.

Neil Morris, from Aviation Ltd at Kapiti, has seen the results of ignoring items like those. He says it's important to get a detailed pre-purchase inspection from a trusted maintenance provider.

"Ideally, the engineer who'll be maintaining your aircraft should complete the pre-purchase inspection – after all, it's in their interests to look after their future customer. But at least get a comprehensive report from an experienced engineer who's familiar with the aircraft type.

"I've seen buyers, relying on an aircraft's fresh 100-hr inspection and review of airworthiness, hit 'buy now', only to find thousands of dollars of due maintenance needed straight away," says Neil.

He points out that the 100-hr inspection and review of airworthiness are just two of the 100 or so maintenance items due at various calendar times or flight hours.

"A potential purchaser needs to think about the other 98 items. What are they, when are they due, what do they cost? These are the questions you need to ask the engineer doing the pre-purchase inspection.

"Remember the costs of hidden and unexpected maintenance could have bought you a lot of rented flying hours."

The 'must-dos' during the purchase period

The CAA's senior aircraft registrar, Julia Reed, says with the sale and purchase of an aircraft, its Certificate of Registration becomes void.

"While it's the joint obligation of both parties to notify the CAA, it's the vendor's responsibility to submit the paperwork and pay the transfer fee. They have 14 days to do that."

It's in the seller's interests to do that because they're liable for any infringements or occurrences arising from the use of the aircraft while it's registered in their name.

"The purchaser must make sure the aircraft is registered to them and a new Certificate of Registration has been issued.

"When you get the new registration certificate," says Julia, "check the details on it are correct, and keep it in a safe place so it can be produced on request."

Annual registration and participation levies

Each year, on 1 July, the annual registration and participation levy is charged to all registered aircraft. If you buy your aircraft after this time make sure the invoice has been paid by the previous owner.

Julia says non-payment will result in deregistration of the aircraft.

"If your aircraft is not operational for three months or more, the participation levy may be deferred. Check the status of your new aircraft on the 'Aircraft' page of the CAA website. If it's deferred you cannot operate the aircraft."

// Iain Anderson piloting ZK-EVE, his Tecnam P2002 Sierra Mk 2 Light Sport Aircraft, on the runway at Whakatane aerodrome.

Stay 'detail-current'

Next, keep your details up-to-date. Your correct details need to be on the Certificate of Registration, otherwise your certificate is invalid.

"Also, your Emergency Locator Transmitter is critical to any search and rescue operation," says Julia. "So that needs to be registered with the Rescue Coordination Centre. The contact details also need to be kept updated."

Maintenance – *your* responsibility

An area confusing many operators is where the responsibility lies for maintaining the aircraft.

Listen up: it lies with you – the operator.

"An aircraft owner is effectively their own maintenance controller," says CAA Aviation Safety Advisor, John Keyzer.

"So apart from a passing familiarity with what's going on under the cowl, owner/operators need to follow up any airworthiness directives and other instructions for continuing airworthiness with their maintainer, not the maintainer with the operator."

Owners should also ensure their logbooks are current.

"The value of an aeroplane is in its records," says Rex Kenny, Quality Assurance Manager for Flying NZ and an aircraft builder and owner for 20 years.

"The aeroplane itself is almost a representation of those records. Paperwork is king. It's obviously in our interests as owners to make sure the records are being maintained properly.

"It's our obligation as an owner, but it also makes good sense because it's our investment."

It's going to cost

Apart from maintenance, an owner must be realistic about other costs.

Before his aviation career, CAA's team leader of heli ops, Grant Twaddle, was in the financial world.

He says it's best to break charges down into fixed and variable.

"Fixed overheads need to be paid no matter how little you fly – like hangar rent, insurance, and calendar-based maintenance. Variable costs include fuel and time-based maintenance.

"There's expenses related to actually flying – flight planning charges, landing fees, and so on. There are long-term costs you should save for, like engine and propeller overhauls. Finally there's the unexpected payout, due perhaps, to an occurrence."

Someone who extends themselves to buy an aircraft may struggle to cope with the expenditure associated with flying it, turning their dream into a nightmare.

So it's vital a potential buyer doesn't lie to themselves about their ability to cope, financially. If you skimp on maintenance, you could put your life, and the lives of any passengers, at risk.

"If you don't underestimate the cost of owning your own aircraft, it's great to have the freedom to go where you want, when you want," says CAA's Chief Meteorological Officer and aircraft owner Peter Lechner.

"But in exchange for that privilege, you have to act quickly on all maintenance and operating matters. You have to do your bit to make sure everyone else in the sky and on the ground stays safe."

CARBON MONOXIDE POISONING

It's not called the 'invisible killer' for nothing – we can all learn from a recent carbon monoxide incident.

Carbon monoxide (CO) is a toxic gas caused by incomplete combustion, and it can get into the cockpit from leaking exhausts or from combustion heaters.

Many light aircraft heaters use exhaust system heat, and even a small crack or defect in the exhaust system can result in carbon monoxide entering the cabin.

In just over four years, eight cases of CO detection and poisoning have been reported to the CAA.

In the example in the September/October 2018 issue of *Vector*, a Diamond DA 40's CO detector illuminated. The crew cross-checked it with the standby detector which hadn't discoloured. Both crew felt symptoms including light-headedness, and reduced cognition and coordination.

The crew declared a PAN-PAN and followed the Quick Reference Handbook: cabin heat turned off, air vents open, and emergency windows open. The indication continued to occur multiple times during the return. The aircraft landed safely.

The maintenance investigation discovered a hole in the scat ducting linking the exhaust shroud to the heater valve box. This was assessed as a possible cause of the CO exposure but could not be confirmed.

Detection

The risk of CO poisoning is increased because of its colourless, odourless, and tasteless qualities, which makes it very difficult to notice unless you have a detector installed.

Rule 91.509 *Minimum instruments and equipment* requires a CO detector to be installed if the aircraft is fitted with an exhaust manifold cabin heater or a combustion cabin heater.

Even if a detector isn't required, we strongly recommend fitting one, depending on your aircraft and its risk of exposure. They come in various forms from low cost panel-mounted chemical spot detectors (often under $10) through to advanced electronic detectors which may have an alarm function.

Photo: istockphoto.com/rmfox

// A view of a cockpit with a carbon monoxide spot detector fitted.

You need to actively monitor spot detectors for discolouration. They also expire so need to be replaced more frequently. It's good to check the expiry and spot colour when working through your preflight, engine run-ups, and during your flight.

Be mindful that CO detectors aren't necessarily foolproof, so be alert to any signs of possible exposure. The initial symptoms of CO poisoning can include headaches, nausea, and dizziness. More advanced effects can include blurred vision, impaired judgement, and drowsiness. These symptoms continue to increase in severity, leading to seizures, unconsciousness, and eventually, death.

What to do

If you detect CO, or your detector activates, there are some general steps you can take. The key message, however, is to land without delay.

- Try to isolate the source of the CO. If cabin heat is selected on, turn it off.
- Ventilate the cabin with as much fresh air as you can. If you have oxygen available, use it.
- Check yourself for symptoms.
- Advise ATC, and land as soon as possible.
- Seek medical attention, even if you feel better after landing.

The effects of CO can take considerable time to clear. While some breaths of fresh air might make you feel better, it can take longer for the effect of CO on your cognitive ability and motor skills to clear. So don't fly or drive after an occurrence.

Reporting

It's important to report any examples of CO poisoning to the CAA. Even if it's only suspected, reporting your experience can help inform analysis on CO trends with particular aircraft types or parts.

To report any occurrences, visit www.caa.govt.nz/report, email isi@caa.govt.nz, or call 0508 4 SAFETY.

More information

To read more on CO poisoning and detection, read our previous *Vector* articles:

- Carbon Monoxide Poisoning (March/April 2012)
- Carbon Monoxide (September/October 2004)
- CO in the Cockpit (March/April 2001)

SUBSCRIBE TO CABIN SAFETY

We've created a new email notification list dedicated to cabin safety.

Make sure you subscribe to this to stay in the loop with updates to cabin safety content on the CAA website.

To subscribe, visit caa.govt.nz/subscribe. If you're already a subscriber, you can add the 'Cabin Safety' list to your existing subscription using the links at the bottom of the page.

You may be a pilot, engineer, operator, or other participant – but please pass this on to anyone you know who is involved in cabin safety and may benefit from receiving cabin safety information.

RADIOTELEPHONY CHANGES

It's all about the hundreds and thousands. There are some minor ICAO changes to radio phraseology that became applicable 8 November 2018.

Application	Example	Transmitted as	What's changed?
flight levels	FL 200	flight level two hundred	use hundred instead of zero zero
altimeter setting	1000	QNH one thousand	use thousand instead of zeros
transponder codes	2000	squawk two thousand	use thousand instead of zeros

BEYOND VISUAL LINE OF SIGHT – THE NEXT STEP FOR UA

The CAA is considering applications for the testing of unmanned aircraft flying beyond visual line of sight to help make sure such operations are safe.

Civil Aviation Rules allow for unmanned aircraft (UA) to be flown beyond visual line of sight (BVLOS). But to date, a solution has not been found to adequately manage the safety of such an operation.

Technologies are being developed for this though, because the future of UA is seen in operations out of the operator's sight.

CAA's manager of UA Clayton Hughes says the CAA wants to allow for testing of these technologies to make sure they're safe.

The University of Canterbury has its own test area, and the Authority is now considering a limited number of applications to have special use airspace designated for BVLOS trials.

Clayton says that won't result in random UA let loose in experimental flying.

// This photo (used with permission) shows an example of the type of ground control station that will be required for drone operations beyond visual line of site (BVLOS).

"There's got to be very strict controls in place before we consider approval. And we don't intend to approve multiple restricted areas throughout the country.

"Even when a restricted area is designated for the purposes of testing BVLOS flight, other aircraft may be able to fly in that area. They must contact the 'administering authority' for access approval."

He says the restricted areas will not be permanently activated.

"They'll be activated for testing systems of UA only – not for normal operations. Also, applicants cannot charge for the use of, or access to, that airspace.

"But they can charge for the use of ground facilities if they want to host other organisations testing UA.

"We can also put limitations on the use of the restricted airspace, for instance, how many testing flights in a week, or on what days.

"That's part of setting up an area so the risk to other users is mitigated.

"And as part of the application, operators need to talk to the local aviation community about how the proposal could affect them."

The CAA is required to consult with affected parties before designating airspace. This is in addition to any consultation an applicant has carried out.

As well as the airspace process, operators wanting to undertake BVLOS operations have to get approval through the Part 102 process.

That includes assessing whether the aircraft is built to design standards, maintained properly, and whether there are systems covering how they are operated.

To read a previous article in the May/June 2018 *Vector* on UA and the importance of reading NOTAMS, visit www.caa.govt.nz, "Quick Links > Publications > Vector magazine".

// AUCKLAND GAP

The Auckland GAP booklet has undergone a major revision incorporating recent airspace changes.

The GAP gives an overview for any pilot flying in and around Auckland, which has some of the most complex airspace in the country.

It has a user-friendly summary of airspace as well as landing and arrival procedures for 10 aerodromes. It also highlights some of the potential dangers.

Most of the 43 photos have been updated to reflect the quickly changing urban spread in the country's biggest city.

Visual assistance is also provided in the form of 3D airspace graphics of Ardmore and Auckland.

Pilots can use the booklet as part of their preflight planning, together with *AIP New Zealand*, Vol 4, and the appropriate VNCs.

It's an especially useful tool for newer pilots or those not familiar with the area.

To order free booklets email: info@caa.govt.nz.

It's also on the CAA website, www.caa.govt.nz, "Quick Links > Publications > *Good Aviation Practice* booklets.

PLB CLARIFICATION

In the September/October 2018 issue of *Vector*, one of our interviewees mentioned a personal locator beacon (PLB), but described a device that is a satellite messenger – not a PLB. A PLB works on a specific frequency, 406 MHz, and is defined in Part 1. For further information, visit beacons.org.nz.

AVIATION SAFETY ADVISORS

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

Don Waters – North Island
027 485 2096 / don.waters@caa.govt.nz

John Keyzer – Maintenance, North Island
027 213 0507 / john.keyzer@caa.govt.nz

Carlton Campbell – South Island
027 242 9673 / carlton.campbell@caa.govt.nz

Neil Comyns – Maintenance, South Island
027 285 2022 / neil.comyns@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 website, www.aipshop.co.nz.

Pilot and Aircraft Logbooks
These can be purchased from your training organisation, or 0800 GET RULES (0800 438 785).

Rules, Advisory Circulars, Airworthiness Directives
These are available free from the CAA website. 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 Aeropath (Airways) published cut-off date.

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

For more, see **www.caa.govt.nz/general-aviation/aviation-events/**.

CAA cut-off date	Aeropath (Airways) cut-off date	Effective date
19 Dec 2018	**26 Dec 2018**	**28 Feb 2019**
16 Jan 2019	**23 Jan 2019**	**28 Mar 2019**
13 Feb 2019	**20 Feb 2019**	**25 Apr 2019**
13 Mar 2019	**20 Mar 2019**	**23 May 2019**

See **www.caa.govt.nz/aip** to view the AIP cut-off dates for 2018/19.

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 website, **www.caa.govt.nz**, "Accidents and Incidents". Some accidents are investigated by the Transport Accident Investigation Commission, **www.taic.org.nz**.

MD Helicopters 500N	
Date and Time:	20-Mar-2014 at 08:30
Location:	Mahia
POB:	2
Damage:	Substantial
Nature of Flight:	Agricultural
Pilot Licence:	Commercial Pilot Licence (H)
Flying Hours (Total):	13621
Flying Hours (on Type):	2470

The helicopter was engaged in a commercial external sling load operation, ferrying equipment for a controlled burn-off. After dropping off the equipment, the helicopter began its return journey to the loading site. As the helicopter climbed out of a valley, it lost power. The pilot immediately executed an autorotation; releasing both the long line and cargo net from the helicopter. During the autorotation, the pilot was unable to clear the steep sloping terrain, and the helicopter struck the side of the ridge, coming to rest approximately 60 m down the slope.

The safety investigation determined that the loss of engine power was caused by a catastrophic compressor failure. The compressor failure was caused by the release of a single compressor blade on the first stage compressor wheel, due to a high cycle fatigue crack.

The accident highlights the hazards involved in low-level operations. It also highlights the considerations that operators and pilots should take into account when conducting risk assessments and determining the safest way of accomplishing the task.

CAA Occurrence Ref 14/1159

Cessna 185B	
Date and Time:	16-Mar-2015 at 11:24
Location:	Motatapu Valley
POB:	4
Injuries (Fatal):	4
Damage:	Destroyed
Nature of Flight:	Private Other

During a private flight from Wanaka aerodrome to the Branches Station, the aircraft collided with terrain in the Motatapu River North Branch, near Wanaka. All four occupants on board were fatally injured.

The CAA safety investigation found that the aircraft collided with terrain during a poor visibility reversal turn.

The forecast weather conditions were not conducive for flight under Visual Flight Rules for the route intended to be flown. There was no evidence to suggest the pilots were subjected to any time pressure to reach their destination.

The CAA safety investigation determined that the actions and decision-making by the pilots prior to, and during, the flight, including a breach of Civil Aviation Rules and not following recommended practices, contributed to the accident.

A full report is on the CAA website.

CAA Occurrence Ref 15/1129

Robinson R44 II	
Date and Time:	30-Nov-2015 at 14:15
Location:	Mt Tarawera
POB:	3
Injuries:	0
Damage:	Substantial
Nature of Flight:	Transport Passenger A to A
Pilot Licence:	Commercial Pilot Licence (H)
Age:	24 yrs
Flying Hours (Total):	251
Flying Hours (on Type):	98
Last 90 Days:	57

The helicopter was on a standard scenic flight route which included a planned landing on top of Mt Tarawera.

The pilot-in-command (PIC) approached the normal landing location from the north, and in line with the western crater rim, as had been done earlier that day. During the final stages of approach, the aircraft experienced turbulence and an increased rate of sink. The pilot allowed the airspeed to decrease with the intention of turning into wind for the final stage of approach and landing. However, the sink rate increased and PIC flight control input was insufficient to arrest the rate of sink. This resulted in the helicopter contacting the ground heavily and short of the landing area. The PIC decided to complete the landing at that point, however, the tail rotor contacted a rock that was unseen by the PIC.

Two contributing factors were identified in the operator's investigation:

1. The PIC carried out the approach and landing based on information obtained during an earlier flight, and failed to notice that the wind direction had changed.
2. The PIC did not provide the required control inputs to prevent the heavy landing.

CAA Occurrence Ref 15/5585

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 website, **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

Britten-Norman BN2A-26

Push Rod

Part Model:	O-540-E4C5
Part Manufacturer:	Lycoming
ATA Chapter:	7200
TSO Hours:	1167.9
TTIS Hours:	1167.9

While approaching the aerodrome, the starboard engine started running rough, accompanied by loss of power. The cylinder head temperature gauge was reading slightly higher on the starboard engine, 440 degrees, compared with 390 degrees for the port engine. The starboard engine then started vibrating and approximately one minute later, smoke was observed coming out of the engine. The pilot decided to shut down the starboard engine. Oil was observed on the engine cowling and landing gear. The aircraft landed safely.

The maintenance investigation found that the No.2 cylinder push rod had fractured, causing the exhaust valve to remain closed. It's suspected that on the subsequent intake stroke, the inlet valve was forced shut by premature combustion, causing the inlet push rod to fail. A subsequent strip of the engine revealed no further damage. The engine was reassembled with the No.2 cylinder inlet and exhaust valve components, including roller cam followers, being replaced in accordance with Lycoming 60294-7-14.

CAA Occurrence Ref 18/120

Piper PA-18A-150

Carburettor

ATA Chapter:	7320

During the final stage of the landing flare, the engine stopped. The pilot was able to manoeuvre the aircraft clear of the runway as it came to a stop. The pilot was able to restart the engine and taxi to the gliding club. The aircraft was then taken to the maintenance provider for investigation.

The maintenance investigation found that the engine idle speed was set low at 500 RPM which could have caused the engine to stop with a low forward airspeed. This was adjusted to 750 RPM and the idle mixture setting also adjusted. Engine runs were carried out and the aircraft was released to service.

CAA Occurrence Ref 18/5023

Cessna 172S

Fuel Flow Divider

Part Manufacturer:	Precision
ATA Chapter:	7300
TSI Hours:	2.3
TSO Hours:	548.8
TTIS Hours:	3551.1

Thirty minutes into the training flight, the engine cut out for approximately three seconds. The crew carried out trouble checks and found the engine ran rough when selected to either the left or right magneto, but ran smoothly when selected to the BOTH position. There was adequate fuel on board, the fuel selector was selected to BOTH position and the mixture was RICH. A diversion was considered, but due to a lack of suitable aerodromes it was decided to fly back to Hamilton aerodrome.

A PAN-PAN was declared and the aircraft landed safely at Hamilton aerodrome. When the throttle was completely closed on landing, the engine stopped. The engine was able to be restarted again and the aircraft taxied to the apron.

During the maintenance investigation, the fuel system was inspected for contamination, with no contaminants found in the fuel tanks or system. An engine ground run was carried out with no faults found. The fuel delivery pressure from the engine driven pump was 26 psi at idle. The engine performed as expected, and no fault could be found. The fuel nozzles, fuel lines, and hoses from the firewall forward were removed and checked for contamination and blockages, but none were found.

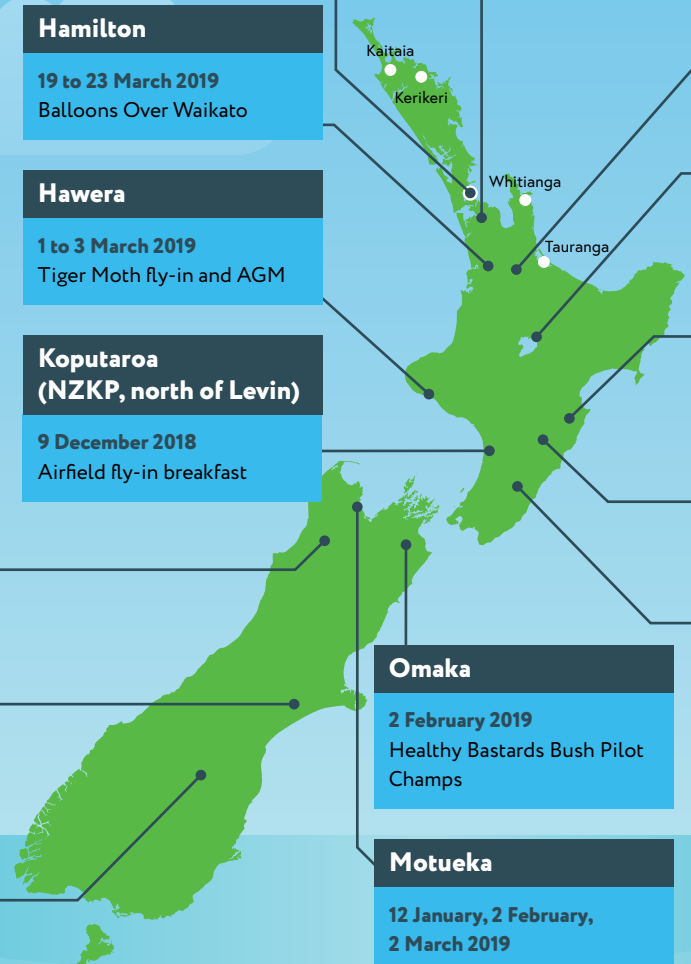
The Fuel Control Unit (FCU) and fuel distribution valve (flow divider) were removed and sent to the maintenance provider for investigation. The gascolator filter and the FCU filter were checked for contamination with nothing found. The maintenance provider's report stated that the FCU had minor contamination in the Servo Regulator but it would not cause the reported problem. They also noted that the flow divider had a sticking plunger and light surface corrosion which could result in the reported engine cut. The FCU and flow divider were refitted to the engine and necessary ground runs were carried out, with all figures in the green. The aircraft was returned to service.

CAA Occurrence Ref 18/5323

SUMMER TRAFFIC BUSY SPOTS

Don't inadvertently fly into an aviation event – check AIP Supplements for planned events, and check NOTAMs on the day. If you don't subscribe, you can download AIP Supplements from www.aip.net.nz and NOTAMs from ifis.airways.co.nz.

This map shows the known flying events between late November 2018 and late March 2019.



North Shore
13 to 17 February 2019
Flying NZ nationals

Drury
7 to 13 January 2019
Auckland soaring champs

Matamata
2 to 7 January 2019
Model flying nationals

11 to 25 January 2019
Walsh Memorial Scout Flying School

Hamilton
19 to 23 March 2019
Balloons Over Waikato

Taupō
27 January to 9 February 2019
Club class gliding nationals

Great Northern Air Race
26 to 28 January 2019
- In an area encompassing North Shore, Kaitaia, Kerikeri, Whitianga, Tauranga

Hawera
1 to 3 March 2019
Tiger Moth fly-in and AGM

Waipukurau
1 January 2019
'First in the world' fly-in

Koputaroa (NZKP, north of Levin)
9 December 2018
Airfield fly-in breakfast

Dannevirke
25 to 28 January 2019
Autogyro fly-in and AGM

Murchison
26 January to 3 February 2019
Hang Gliding nationals

Masterton
22 to 24 February 2019
Wings Over Wairarapa

27 February to 2 March 2019
Aerobatic nationals

2 to 9 March 2019
Central Districts gliding champs

Ashburton
8 to 10 February 2019
SAA Great Plains Fly-in

Omaka
2 February 2019
Healthy Bastards Bush Pilot Champs

Omarama
6 to 15 December 2018
Youth soaring development camp

2 to 12 January 2019
Gliding nationals

Motueka
12 January, 2 February, 2 March 2019
AD closed for drag racing (check NOTAM for alternate days)

KEEP THESE EVENTS IN YOUR CALENDAR

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