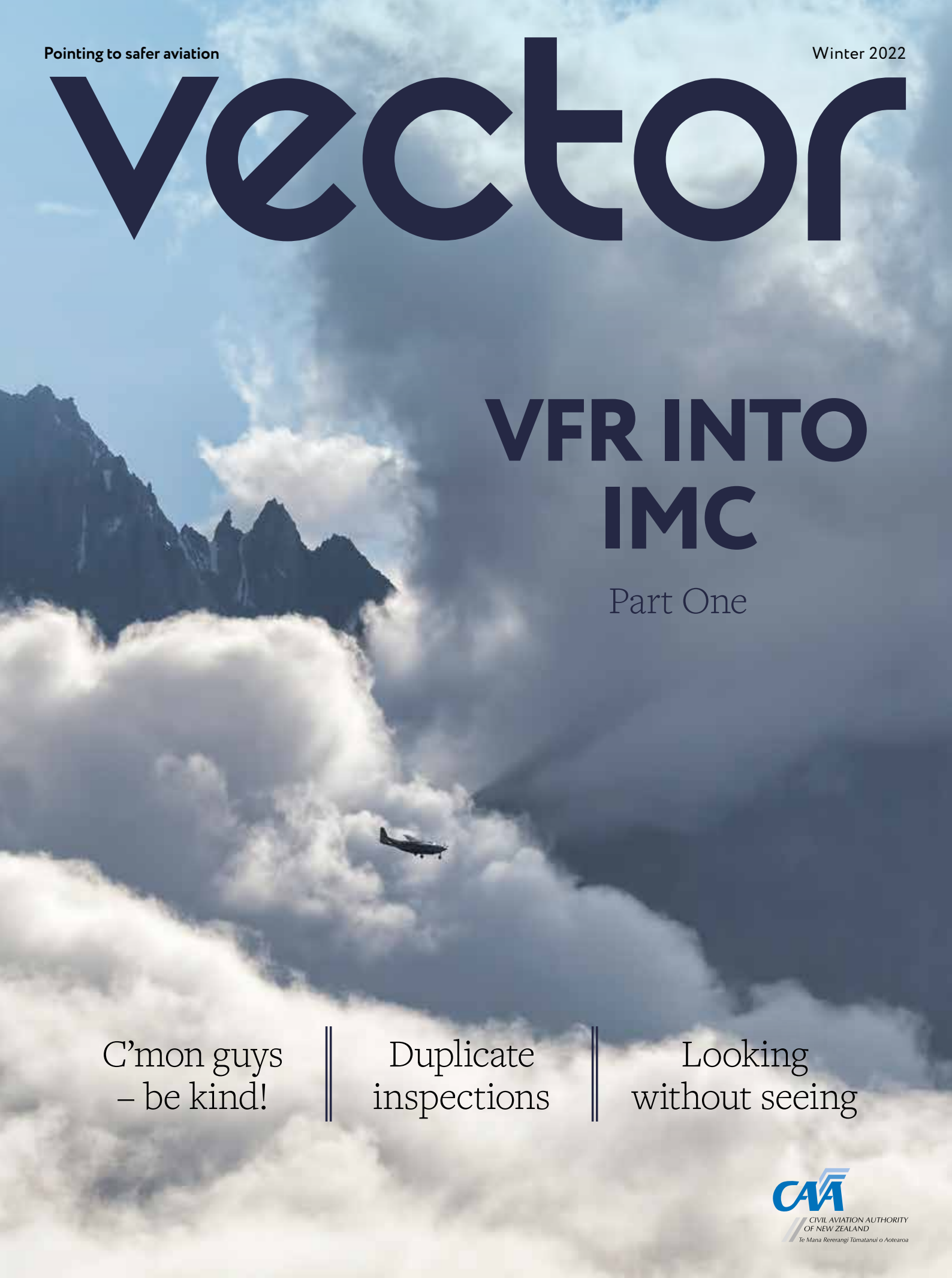
Pointing to safer aviation

Winter 2022

vector



VFR INTO IMC

Part One

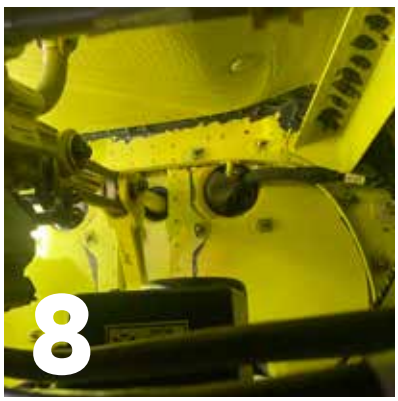
C'mon guys – be kind!

Duplicate inspections

Looking without seeing

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

// C'MON GUYS – BE KIND!



// DUPLICATE INSPECTIONS

// LOOKING WITHOUT SEEING

Cover photo: iStock.com/mscornelius

New research is indicating why VFR pilots, despite being aware of the risks, continue to put their lives on the line, by entering IMC.

See our cover story on page 4.

In this issue...

// VFR INTO IMC – PART ONE

vector

CIVIL AVIATION AUTHORITY OF NZ

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Reader comments and contributions on aviation safety are welcome. Let us know your thoughts by emailing vector@caa.govt.nz. We'll try to publish a selection in each edition, although they may be edited or shortened.

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C'MON GUYS BE KIND!

Discourtesy in radio calls appears to be increasing.

Photo: iStock.com/courtneyk

Maybe it's the effect of COVID-19. We're all a bit, or a lot, more stressed than a few years ago – it *is* a tumultuous time. But scathing radio calls don't help.

The Good Aviation Practice booklet, *Plane talking*, says, "The key to flying at uncontrolled aerodromes is to show as much courtesy to others as you would like them to show you". That applies anywhere.

No one wants to be chastised 'in public' over the radio, and since the pilot who's never made a mistake hasn't been born yet, maybe it's time to cut our fellow pilots a bit of slack.

CAA Aviation Safety Advisor Carlton Campbell says that during recent visits to South Island operators, he's increasingly heard of instances of 'air rage'.

"Nasty finger-pointing over the radio is absolutely inappropriate and achieves nothing in terms of aviation safety. In fact, it increases risk.

"It invites an emotional reaction from the 'accused' pilot that could lead them to make poor decisions.

"Not to mention the pilot doing the berating has just increased their personal risk by potentially letting their emotional energy and anxiety divert their attention from their own pilot responsibilities of appropriate aviating, navigating, and communicating."

Carlton says some pilots have been particularly – and vocally – judgemental of students.

"It's the worst-case scenario. The student is perhaps in unfamiliar territory, maybe with English as a second language, flying solo, and trying to comply with their supervising instructor's briefing. An explosion of swearing and accusations over the radio will simply make them more stressed than they already are, with a potentially adverse outcome."

Carlton says pilots need to hold their frustration in check, breathe, and leave their talk with the other pilot until they're both on the ground.

"Chill out, hold, yield, pause, accept the situation, and determine how to make it better.

"Don't make a less than ideal situation worse. On the ground, without emotion, is the best way to educate about mistakes.

"We're all human and therefore prone to error. In the interest of safety, we all deserve a bit of latitude."

Comments or queries?
Email **carlton.campbell@caa.govt.nz**

VFR INTO IMC

Part One

With VFR-IMC being consistently one of the top 10 causes of aviation accidents worldwide, new research is taking a fresh look at pilot decision-making.

Photo: iStock.com/Bogentom

"The gravest mistake made by the pilot was his persistent attempt to continue visual flight in impossible conditions... [he] showed a serious lack of responsibility for the safety of the aircraft and of the passengers on board."

This comment, in *Vector*, then named *Flight Safety*, appeared in its very first issue, 50 years ago.

Despite a half century of increasingly sophisticated sources of weather information, dazzling cockpit tech, advances in training, and a general maturing of the sector, VFR pilots continue to get entangled in instrument meteorological conditions (IMC), often with devastating consequences.

The stats across the world are stubbornly high and indicate how lethal such occurrences are.

In New Zealand, in the 15 years from January 2000, 31 people died in CFIT[1] accidents – about one accident a year – caused by continued flight into deteriorating weather[2].

And, according to the online aviation library, SKYbrary[3], 75 percent of weather-related GA fatalities are in VFR-IMC accidents.

A personal account[4]

"The day before, weather had stopped me completing a job, so I was feeling pressure from the client to get the job done, and efficiently. So I was looking for any way I could, to take the most efficient route. And as a result I was pushing the weather.

"[I'd] got away with a close-ish call. So I thought to myself, 'I've got this nailed. I'm a good pilot and, as long as I've got a tree as a reference, there's no way I can go inadvertent IMC'."

In the thickening murk, the pilot lost his tree and over the next ten or so minutes, flew blind in cloud, repeatedly climbing and descending, the airspeed careening between 40 and 140 knots.

"I remember looking down through the bubble between my feet, just seeing grey, and waiting for the trees to smash through."

The machine finally popped out at 14,000 feet.

// I remember looking down through the bubble between my feet, just seeing grey, and waiting for the trees to smash through. //

"I was at a point in my career where I was cocky and complacent and operating right on the line. I'd had that close call a few days earlier but I'd got away with it. And that reinforced to me that I was awesome."

Fast thinking

Matt Harris, former CAA Chief Advisor, Human Factors, says the VFR into IMC statistics indicate the complex nature of the factors behind the phenomena, and "they demonstrate that more needs to be done to understand why pilots continue".

Now, a Griffith University doctoral thesis[5] is providing some of that understanding.

The thesis says VFR pilots who enter IMC are unconsciously influenced by what's known as 'fast thinking' – thinking shortcuts we all use before making a decision.

Actively engaging the brain and processing lots of information takes effort and can be pretty inefficient when we need to make quick decisions.

On the ground, therefore, a thinking shortcut can be useful. If we're in a hurry and need a packet of crackers from the supermarket, we might just grab a familiar pack, or the cheapest. We don't stand for hours staring at the choices on the shelves, trying to weigh up the advantages and disadvantages of each option.

"But fast thinking in aviation," says Matt Harris, "can lead us to make incorrect – and fatal – judgements." »

1 Controlled flight into terrain.
2 Source: CAA.
3 SKYbrary – *Inadvertent VFR Flight Into IMC.*
4 *Vector*, Winter 2019, "Rotary visibility issues".

5 Stanton, A. A, (2022) *'Gathering Clouds' A study of plan continuation, risk, rules and pilot behaviour,* [Unpublished doctoral dissertation]. Griffith University.

Deciding to fly. Deciding to continue flying.

The Griffith University research indicates VFR into IMC is likely the result of the pilot being influenced by a clutch of these thinking shortcuts.

The shortcuts – or 'biases' – are active right from the initial decision to fly.

The 'confirmation bias' of a pilot who very much wants to fly has them paying attention mainly to information confirming the opinions they already have – and ignoring, or minimising, the information which doesn't.

"In the setting of VFR flight into IMC, confirmation bias might result in a pilot subconsciously searching for environmental cues that the weather conditions are slightly above the minimum required, steady, or improving, when the opposite is true," says Anthony Stanton[6], the lead author of the Griffith research.

A second thinking shortcut, 'anchoring bias', has that pilot relying on the first piece of information (the anchor) they received, and then making estimates or judgements based on that anchor. This first piece of information becomes an arbitrary benchmark for all other information.

"An anchoring bias might result in pilots placing too much emphasis on earlier (good) weather forecasts," says Anthony, "and then evaluating – through the lens of the original forecast – the actual weather being experienced as better than it actually is."

These biases, combined with a lack of training or experience is often the cause of pilots going inadvertent IMC (IIMC).

The decision to *deliberately* enter IMC is influenced, the Griffith researchers say, by three more unhelpful biases.

'Framing bias' is how a pilot values the option of turning back from bad weather.

"If they frame the decision as a gain – lives and aircraft saved – they're more likely to turn back. If they frame that decision as a loss – time wasted, clients let down – they'll tend to keep going," says Anthony.

'Sunk cost bias' has us continuing with a decision and a path, because we've already put so much into it. In the VFR pilot's mind, that might be time and fuel, and maybe promises to clients.

The most worrying bias reported by the researchers, however, is 'self-evaluation bias', also known as the Dunning-Kruger effect[7].

Source: City of Calabasas, in NTSB report AAR-21/01 PB2021-100900.

// State highway camera image of N72EX, carrying Kobe Bryant, pilot Ara Zobayan and seven others, as it disappeared into cloud, about two minutes before it impacted terrain.

Simply put, self-evaluation bias is the tendency for people – pilots included – with less ability and experience than others to think they're actually pretty good.

"We found a large number of the more than 400 pilots we studied had a mistaken, elevated appreciation of their own skill levels," says Anthony.

"And, consistent with the Dunning-Kruger effect, the pilots who substantially overestimated their ability were the less able pilots.

"Nevertheless, because they believed they were better than they were, they were also less risk-averse and more likely than others to be comfortable with the idea of entering IMC."

Matt Harris says pilots might actually be quite good at accurately assessing the risks, "but we need to also understand these other factors can prejudice our decisions".

Killer pressure

The helicopter pilot's IIMC account on page 5 illustrates some of the pressure propelling VFR pilots into IMC.

CAA Aviation Safety Advisor Mark Houston, a 14,000-hours agricultural pilot, saw all types of pressure in his 40-year career. "For instance, to leave because others had or were about to, to start or finish a job, or to keep the customer or operator happy".

Mark was not immune.

"'It's only a little bit of low scud that'll burn off in an hour, so get out now and you'll be right' were words from a peer that I thought, nine minutes later, would be the last I would ever hear," Mark says.

He says the ultimate decision to fly lies with the pilot.

"Responsibility for their own safety, and to their family to come home safely, should outweigh obligations to their employer, their colleagues, and especially to their own ego."

6 GA pilot (8,000 hours), flight examiner, former flying school CFI. CASA branch manager of sport and recreational aviation. His research is separate from his CASA role.
7 "Flying near Mt Stupid" *Vector* Spring 2019.

// We have a culture of flying at low level in poor weather to get a job done. //

Jim Finlayson, A-category helicopter instructor and flight examiner[8], agrees, and believes that New Zealand helicopter pilots are at particular risk of IIMC accidents.

"We have a culture of flying at low level in poor weather to get a job done. It's up to experienced pilots and operators to be in the forefront of changing that culture.

"So, if a pilot says to their boss 'I can probably push through that weather if you want me to', the answer from the boss should be an unequivocal 'no'. Without such leading by example, we're going to continue to have IIMC and poor weather CFIT accidents."

Pilot self-induced pressure appears to have been the main factor in the accident that killed the American basketball star Kobe Bryant and eight others, in January 2020, in California.

In its investigation, the US National Transportation Safety Board (NTSB) found there had been no pressure from his employer, Island Express Helicopters, nor from Bryant himself, on the pilot to fly.

But repeatedly during the accident flight, the 8600-hours pilot, Ara Zobayan, flew with less than regulation visibility, just under the clouds rather than 500 feet below them, at a lower altitude than his employer recommended, and at speeds far exceeding those recommended by the IIMC training he'd received seven months before.

He also shunned the recommendation in that training that a pilot should divert, land, or turn back rather than take a chance on poor conditions.

According to *Vanity Fair* magazine[9], Kobe Bryant flew exclusively with Island Express Helicopters, giving it a sheen of celebrity, and Bryant often asked for Zobayan, the operator's chief pilot, by name.

Getting Bryant to where he needed to be was number one for the VFR pilot.

On the day of the accident flight, the LA police grounded its helicopters due to the conditions. But Zobayan only partially completed a mandatory flight risk analysis checklist, failing to enter into it updated preflight weather information. This kept the flight risk score on the checklist low enough that he didn't have to discuss the intended flight with his company's operations director, nor develop an alternate plan.

With the determination to get his prestigious client to his destination overriding what the NTSB said was Zobayan's "typical judgment and decision-making behavior", it's no surprise the NTSB found plan continuation bias, or "get-there-itis" also a factor in the accident.

Get-there-itis is thought to be one of the most common reasons a VFR pilot will plunge into deteriorating weather, pressing on with a plan, despite evidence it's not working.

Research conducted by the Australian Transport Safety Bureau[10] indicates that plan continuation bias increases as the flight progresses.

CAA safety investigations have often found that pilots dying due to VFR flight into IMC accidents were in the final 20 percent of their journey when their aircraft impacted terrain.

And Ara Zobayan had just on a third of his journey to go, when he entered cloud.

Matt Harris says self-induced pressure to get to a planned destination can be extremely powerful.

"It's probably more effective to minimise the *external* influences that make the decision to continue seem like the only option.

"That's by planning, and having a suitable alternative, and setting clear expectations to passengers that if the weather is bad, then it's unsafe to continue."

Comments or queries? Email **vector@caa.govt.nz**

// PART TWO OF *VFR INTO IMC*

Part Two of *VFR into IMC*, in the Spring 2022 *Vector*, will look at further reasons pilots become ensnared by instrument conditions, and will offer some expert advice about how to avoid them.

8 And also CAA's Senior Advisor, Dangerous Goods.
9 "Kobe Bryant's Tragic Flight" *Vanity Fair*, 25 January 2021.
10 "General Aviation Pilot Behaviours in the Face of Adverse Weather", atsb.gov.au, 2005.

DUPLICATE INSPECTIONS

Some recent occurrences illustrate the vital importance of carrying out a thorough duplicate inspection.

At the very start of the post-maintenance check run, the rotary pilot experienced an uncommanded yaw, the aircraft spinning to the left. The spin was arrested when the fuel was cut off to the engine. Fortunately, the aircraft had barely become light on the skids.

Within minutes, in what the chief pilot calls "quite a moment", it was discovered the tail rotor push-pull tube forward attachment bolt had not been fitted correctly. (For non-engineers: the tail rotor flight control had not been reinstalled properly.)

When the bolt was installed, it didn't go through the control tube rod end, before the nut was secured. It was only the clamping force on the bellcrank that secured the rod end in place. This was what led to the loss of tail rotor authority during the check run.

How it happened

So what went wrong? Two normally diligent engineers dropped the ball – the first by not making absolutely sure the bolt was installed correctly; and the second by not checking it closely enough during the second part of the duplicate inspection.

"It could have been a terrible outcome," the operator's chief pilot told *Vector*. "If the rod had held in for a bit longer, the aircraft could have got to a low altitude before it gave way. It would have been a very tough thing to deal with, once airborne."

The operator's investigation found that the maintenance and duplicate inspection were carried out in a very confined area, which led to the second engineer, according to the investigation report, not really being able to absolutely "confirm the bolt had gone through the rod end and that the nut was secure.

"The tail rotor control pedals were moved and appeared to work in the normal sense, this gave both engineers the assumption that the work was completed correctly..."

What should have happened

CAA Aviation Safety Advisor John Keyzer says engineers certify in their release-to-service statement that a safety inspection has been carried out, that the control system functions correctly, that it was assembled correctly and locked correctly.

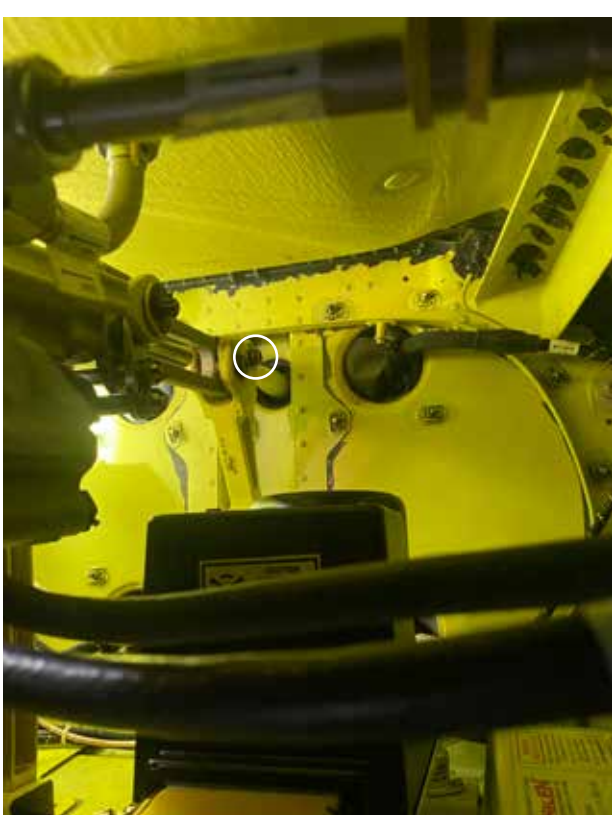


Photo courtesy of operator

// Very hard to see. The bellcrank to rod end bolt is half a metre away from the engineer's head and 90° right to their field of vision.

"Although a system may appear to function correctly, it cannot be taken as evidence that the work has been done properly," John says.

"A greater emphasis is often put on the first part of a duplicate, but the second duplicate inspection can be more important. It's the last chance to identify something isn't correct."

John considers this stage important enough to recommend that if staffing levels allow, there be two independent inspections following the maintenance task.

"That is, that the first or second duplicate is *not* carried out by the same person performing the task."

While the second part of the duplicate inspection can be carried out by someone who has adequate training, knowledge and experience[1], John says it's important that that person is not simply led by the person who carried out the task, and the first part of the duplicate inspection.

In this incident, the engineer who performed the maintenance task and first inspection was senior to the engineer who completed the second part of the duplicate inspection.

While the chief pilot doesn't believe this imbalance in experience had a role to play in the occurrence, the report by an independent engineer, commissioned by the operator, notes there was an "assumption by a junior engineer that the task had been completed correctly by the senior engineer".

Stopping it happening again

The operator accepted the recommendation of the independent report that both maintainer and 'inspector' should have refresher training on the particular aircraft type.

The operator has also emphasised the importance of using inspection aids such as a mirror and cellphone camera when inspecting in confined spaces.

The operator's safety manager told *Vector* that the incident has led to improvements through their safety systems.

Not only has he increased the safety focus on duplicate inspections, but the staff realise that in the company's 'just culture', they can report near-misses or mistakes, without fear of some sort of penalty.

"Which is just about a perfect situation," he says.

Photo courtesy of operator

// The bolt and retaining nut correctly installed in the bellcrank and control rod end bearing.

// IT COULD HAVE BEEN MUCH WORSE...

...had the pilot concerned not followed the normal procedure of running the helicopter up to 100% rotor RPM and placing in some control inputs before lifting off.

"The great thing about flying a helicopter," says the operation's chief pilot, "is that you generally prove it can fly before you're committed. But some test flights I've witnessed are a bit 'grip it and rip it'.

"But it really is a test flight after maintenance, and the guys did that well, which is why the outcome is not as bad as it could have been."

"Having your mate's back"

There've been other instances of failures in duplicate inspections, including very recently, which, former CAA Chief Advisor Human Factors Matt Harris says, indicates that more focus is needed on this important task.

"If the dup is carried out with the expectation that the maintenance will be all good, confirmation bias[2] will corroborate what we anticipate we'll see." »

1 See rule 43.111(b)(2).

2 We pay attention mainly to information confirming our expectations, and we ignore, or don't see, or minimise, information which doesn't.

// There was an assumption by a junior engineer that the task had been completed correctly by the senior engineer. //

But the threat and error management guidance on the CAA website says, "As humans we are all fallible and errors are to be expected. Even the most experienced and well-trained person can make an error."

So duplicate inspections should be carried out with healthy scepticism, says Matt.

"That second engineer should be looking for what has not been done correctly, or is out of the ordinary. Their fresh eyes are essential to the maintaining engineer.

"Maybe it's been a busy day with lots of distractions – go in with the intention of finding anywhere those distractions could have prevented your colleague doing their job fully.

"It's about having your mate's back."

For more information on what the rules say, read rule 43.113 *Duplicate safety inspection of control system.*

Comments or queries?
Email **warren.hadfield@caa.govt.nz**

// OUR THANKS

The CAA thanks this operator, and others who've reported their duplicate inspection failures, for telling us about their occurrences. Reporting is the only way we can know where education should be aimed.

Thanks too, to the operator highlighted in this article, for being willing to share their story with *Vector* readers. It means the rest of you get a free lesson about the importance of duplicate inspections being done effectively.

AIRCRAFT AIRWORTHINESS CATEGORIES
SOME BASICS

The reason there are different airworthiness categories is because the certification requirements are tailored to how the aircraft is intended to be used.

Standard and restricted category

Standard category aeroplanes and helicopters have a type certificate fully complying with an airworthiness design standard.

These are the typical factory-produced aircraft you see at your local aerodrome, many operated by flight training organisations and airlines.

Because of the robust certification process and requirements applied to these aircraft, they can do any operations the rules and their flight manual allow, for example, passenger transport in IMC.

There's also a restricted category type certificate used for specific operational purposes. For instance, a helicopter with a spray system can't meet some rules, say, for passenger safety and emergency exit. The CAA allows that, but with the restriction that the aircraft can't carry passengers when fitted with the spray system.

It may be, however, that, after a morning of spraying, the helicopter can have the spray system removed, and be transporting passengers in the afternoon. So a dual category – restricted and standard – certificate is issued.

Special category

Special category enables a number of slightly more specialised aircraft to be operated under more limiting conditions, without the need for the rigorous requirements of a type certificate.

There are six sub-categories: experimental, primary, amateur-built, LSA (light sport aircraft), limited, and exhibition. See **Part 21 and Advisory Circular AC21-3 for more information.**

We'll just look at the three most common ones.

// THE THREE MOST COMMON SPECIAL CATEGORY AIRCRAFT

Photo courtesy of Pacific Aerospace

Experimental

Experimental aircraft are undergoing test flying – not to be confused with post-maintenance test flying – or research and development. Once a test flight requirement is satisfied, the aircraft will have a new airworthiness certificate issued in one of the other categories.

If an aircraft has been modified, it may need to undergo a flight test programme under the experimental category before being issued its certificate.

Photo: CAA

Amateur-built

Amateur-built aircraft have, as the name suggests, been built – at least 51 percent – by their owners. They complete a flight evaluation process under the experimental category, then have a new airworthiness certificate issued in the amateur-built category.

This category is intended for the private recreational sector where the owner is the aircraft builder and operator. It allows for greater innovation and creativity, without the need for compliance to an airworthiness design standard, but with the balance of more restrictive operating conditions.

Photo courtesy of Roz Anderson Photography

Light sport aircraft

Known as LSAs, these aircraft have been produced and certified by their manufacturer to an agreed set of industry consensus standards. These standards are developed by an international committee, of which the CAA is a member.

These aircraft require a manufacturer's statement of compliance. »

» Microlight category

The means of compliance for an aircraft to be in the microlight category are in Advisory Circular AC103-1. Put simply, these are based on weight and flying speed, or acceptance by some other countries.

Administration is largely through a Part 149 certificated organisation and this results in lower cost for the operators. With privileges though, come some restrictions, including not being permitted to fly over congested areas such as towns or cities.

Sometimes an operator will want to move their aircraft from one of the standard or special categories to a microlight category. This only needs a flight permit and has simplified standards, including the pilot being able to do their own maintenance.

Having moved their aircraft to the microlight category, however, the operator cannot then move it back again – it stays permanently in the microlight category.

If you need advice about this, email **certification@caa.govt.nz.**

Will you own an aircraft on 1 July 2022?

Each July, aircraft owners who do not pay a passenger levy, pay a registration fee for their aircraft and a participation levy based on aircraft weight.

This contributes to the CAA's oversight of aviation safety, including things like the analysis of trends to find out where most risk is.

The fee and the levy are invoiced as at 1 July and the person who has to pay them is the aircraft owner registered with the CAA on that day. That's even if the aircraft is about to be sold.

The Civil Aviation Act 1990 defines 'owner' as the person lawfully entitled to possession of the aircraft for 28 days or longer. That means if you lease the aircraft for 28 days or longer, you are the 'owner' who needs to pay the fee and the levy.

If you're selling your aircraft before 1 July, all the necessary documents, and the applicable fee, need to have been received and actioned by the CAA before 1 July 2022. So send all this in as early as possible to allow time for processing.

If the aircraft is still in your name on 1 July, you will have to pay the fee and levy, even if you've sold the aircraft. Once the CAA has issued you with the invoice, you can't have it transferred to anyone else.

If your aircraft is inoperable at 1 July and remains that way for at least three months, you can request to defer the participation levy. You should request this before your invoice is issued on 1 July. See the information box below.

Payment of the fee and levy is due by 20 July 2022. If it isn't paid, your aircraft may be deregistered but the fee and levy will still be collectable. If the aircraft is deregistered, its airworthiness certificate, or flight permit, is revoked and the aircraft cannot be legally flown.

Comments or queries?
certification@caa.govt.nz
aircraftregistrar@caa.govt.nz

// FOR MORE INFORMATION

Go to **aviation.govt.nz > aircraft > aircraft-registration > fees and levies for aircraft > registration fee and participation levy.**

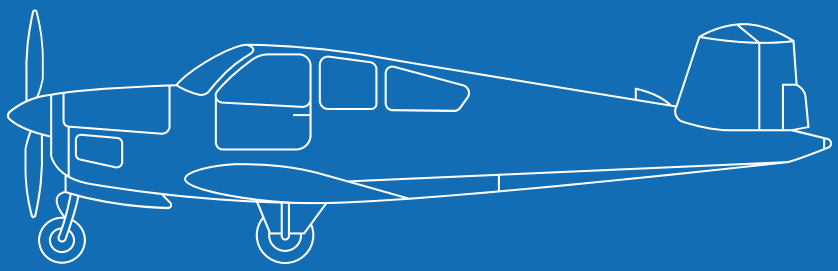
Go to **aviation.govt.nz > forms**, for forms and information relating to the sale of an aircraft, deferral of the participation levy, deregistration of your aircraft, and so on.

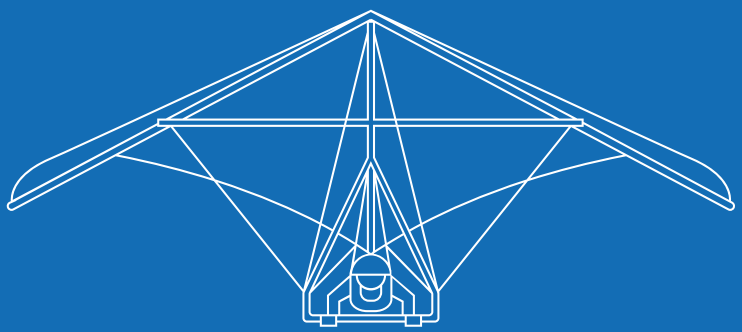
Go to **aviation.govt.nz > about us > what we do > how we are funded > fees, levies and charges** for more information about the aircraft registration fee and participation levy.

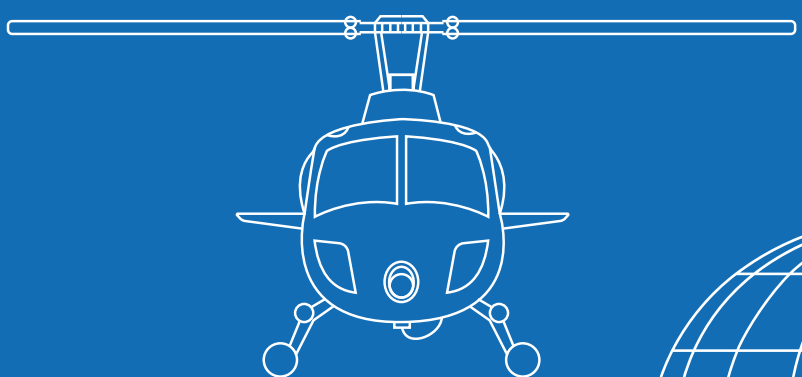
Email **publications@caa.govt.nz** for your free copy of the Good Aviation Practice booklet, *How to be an aircraft owner.* There are more details in there of aircraft categories and their owners' obligations to safe flying in them.

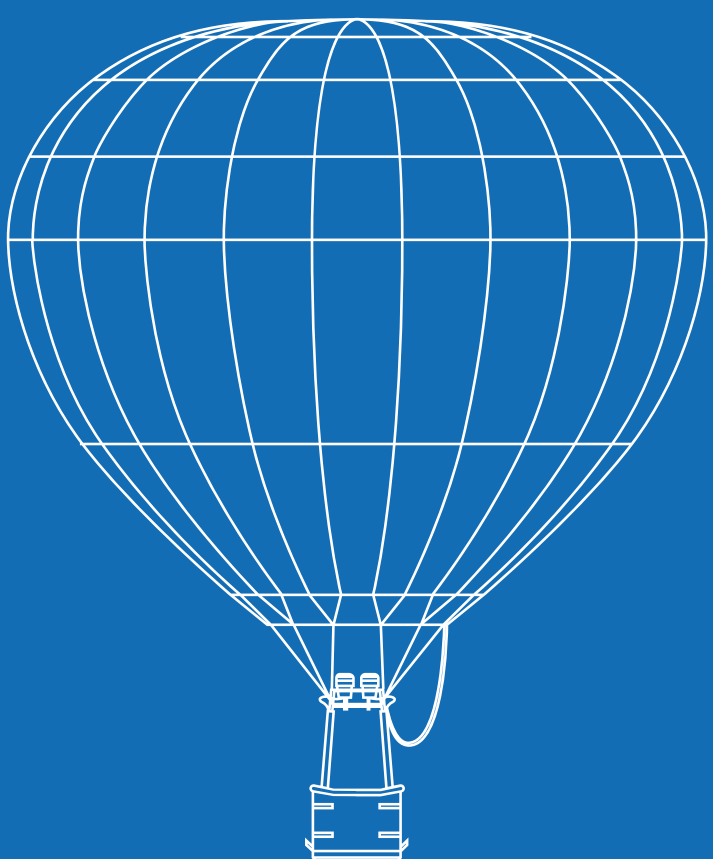
Over the next two pages, you'll find the revised *Aircraft operator requirements* poster. If you're not successful in removing it in one piece, you can get another from one of our aviation safety advisors (contacts on page 23), or email **publications@caa.govt.nz**.

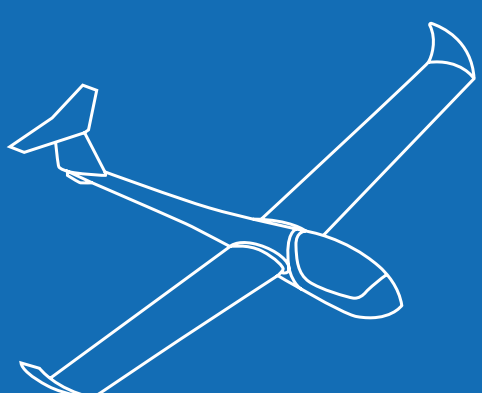
Photo: CAA/Pen Mackay











AIRCRAFT OPERATOR

Certificate of airworthiness	Standard and Restricted Category Airworthiness Certificate			Special Category Airworthiness Certificate			
Class of aircraft	**Aeroplane/ Helicopter**	**Glider**	**Balloon**	**Experimental**	**Exhibition**	**Amateur-built**	**LSA**
Description	Must have a type certificate, and be type accepted in New Zealand if imported.			Aircraft undergoing test flying, flight evaluation, research, etc	Aircraft used mostly for airshows, aerobatic competitions, or the film industry	Aircraft built by their owners for sport and recreation purposes	Factory manufactured Sport Aircra
Pilot requirement – minimum	Part 61 PPL	Part 61 PPL G/Part 61 CPL G, or pilot certificate[3]	No (CPL required for flights for hire and reward)	Part 61 PPL LSA may also be flown by the holder of a microlight pilot certificate under Part 103.[3] Amateur-built gliders may be flown under Part 104.[3]			
Medical requirements	Part 67 Class 1 or 2, or Waka Kotahi NZTA DL9	Part 67 Class 2 (Class 1 for CPL) or Part 149 organisation requirement[5]	No Part 67 Class 1 for CPL	Part 67 Class 1 or 2		Part 67 Class 1 or 2, or Waka Kotahi NZTA DL9	
Operating rules	Part 91 Part 119 (121/125/135) Part 115	Part 91 Part 104 Part 115	Part 91 Part 115	Part 91 Refer rule 91.105 for specific limitations on each ca Exhibition and Limited category aircraft require Operator Statement in accordance with rule 47.55(Only LSA and Limited can be operated under Part 115 (see			
Types of operations	Day/night VFR/IFR[6]	Day only VFR/IMC	Day/night VFR only	Day only VFR only	Day/night VFR/IFR[6]		Day/night VFR only
Can be used for flight training	Yes			No except rating	No except rating	Available to builder/owner	Yes
Maintenance	Rule 91.605 requirements	Part 104 programme	Manufacturer's schedule	Requires an approved programme in accordance with and additional maintenance requirements of Part 43 Additional maintenance programme requirements for or Limited category aircraft are contained in rule 91			
Maintenance to be performed by	LAME or appropriately authorised person[7]	LAME or Part 149 glider engineer	LAME or appropriately authorised person[7]	LAME or appropriately authorised person[7]		LAME or Part 66 maintenance approval holder	ap
Modifications and repairs	CAA approval/ acceptance required Part 21 Subpart C	CAA approval/ acceptance required Part 21 Subpart C[8]	CAA approval/ acceptance required Part 21 Subpart C	CAA acceptance required – see conditions on airworthiness certificate			Manufacture approval
Airworthiness directives	Yes	Yes refer rule 104.103(2)	Yes	Yes Includes ADs for engines, propellers, and components regardless of aircraft type			
Logbooks required	Yes refer rule 91.617			Yes refer rule 91.617			
Registration required	Yes			Yes			

1 Also Primary: FAR 21.24 Category originated by FAA – to allow for future imports.

2 Microlight includes single and two-seat powered parachute, gyrocopters, gliders, helicopters and aeroplanes.

3 Pilot certificate issued by the appropriate Part 149 organisation.

4 Requires pilot qualification issued by approved Part 141 training organisation and Part 102 unmanned aircraft operator certificate.

5 The medical requirements differ for each Part 149 organisation. Under Part 115, me depend on the activity.

6 Dependent on the certification and configuration of the aircraft – refer to the airc type certificate data sheet, operational approval and operating rule requirement

7 Apart from Part 149, authorised persons must meet the requirements of rule 43.51 *maintenance.*

8 See appropriate column if glider is an amateur-built or microlight.

REQUIREMENTS

MAY 2022

[1]		Flight Permit (2-seat only)	No		No
	Limited	Microlight [2]	Parachute	Hang Glider/ Paraglider	UAS
Light aft	Ex-military and vintage aircraft factory-built, – not type-certificated				Unmanned aircraft system (also known as remotely piloted aircraft systems – RPAS; drones; unmanned aerial vehicle – UAV)
		Part 61 PPL/CPL or pilot certificate[3]	Pilot certificate[3]		Part 101 rule 101.205 requirements within 4 km of aerodrome Part 101 – 15-25kg rule 101.215(b)(2) requirements Part 102 in accordance with operator exposition[4]
	Part 67 Class 1 or 2	Part 67 Class 1 or 2, or Part 149 organisation requirement[5]	Part 149 organisation requirement[5] Tandem master for hire or reward Part 67 Class 2	Part 149 organisation requirement[5] Tandem master for hire and reward Part 67 Class 2	Part 101 No Part 102 in accordance with operator exposition
tegory. an c) & (d). Part 115 ACs).		Part 91 Part 103 Part 115	Part 91 Part 105 Part 115	Part 91 Part 106 Part 115	Part 101 Part 102
	Day/night VFR/IFR[6]	Day only VFR only refer rule 103.155	Day/night VFR only refer rule 105.25	Day only VFR only refer rule 106.57	Part 101 day VFR only Part 102 day/night VFR Other ops, refer AC102-1
	No except rating	Yes	Yes		Yes (UAS only)
rule 91.607 Subpart F Exhibition .607(d)		Part 103 Subpart G	Part 105 Subpart C	Part 106 Warrant of fitness	Part 101 – manufacturer's recommendation Part 102 in accordance with operator exposition
LAME or ppropriately authorised person[7]		Annual condition inspection by LAME or Part 149 authorised person	Part 149 authorised parachute technician	Warrant of fitness by Part 149 authorised person	Part 102 in accordance with operator exposition
er's	CAA acceptance required – see conditions on airworthiness certificate	CAA or Part 149 authorised person refer rule 103.209	Parachute technician refer rule 105.107	Owner	Part 101 – 15-25 kg rule 101.202 requirements Part 102 in accordance with operator exposition
		Yes refer rule 103.217	Yes refer rule 105.103	No	No
		Yes refer rule 91.617	Permanent records refer 105.111	No	Part 101 – No Part 102 – Flight records kept in accordance with operator exposition
		Yes	No	No	Part 101 – No Part 102 may be required, refer rule 102.13(b)(3) and AC102-1

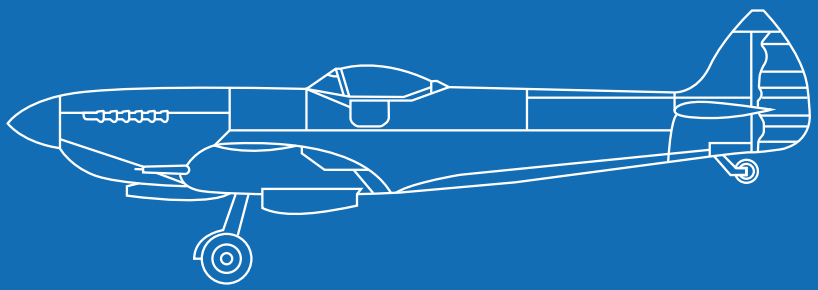
edical requirements

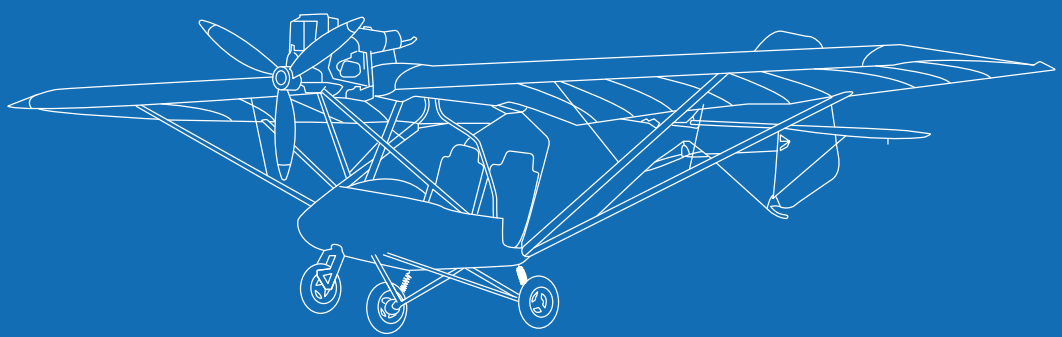
raft flight manual, s.

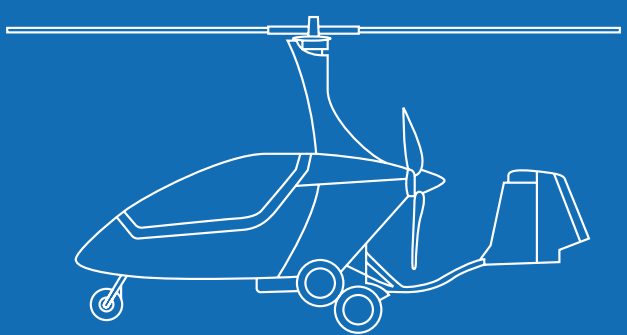
Persons to perform

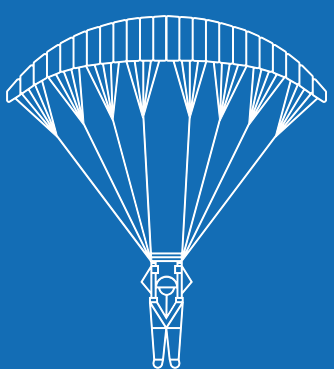
Every effort is made to ensure that the information in this poster is accurate and up to date at the time of publishing, but many changes can occur over time, especially with legislation. Operators are reminded to get appropriate up-to-date information from the CAA website, aviation.govt.nz.

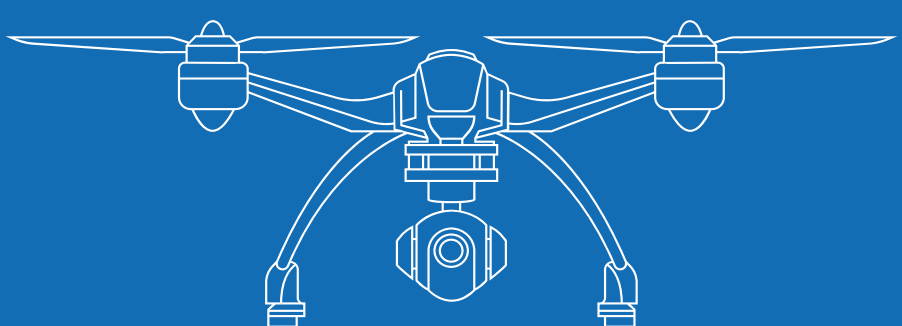
CAA
CIVIL AVIATION AUTHORITY OF NEW ZEALAND
Te Mana Rererangi Tūmatanui o Aotearoa

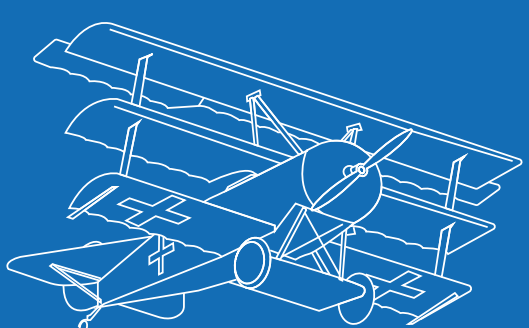












// Plastic jerry cans intended for use with fuel are acceptable.

Photo: CAA

FUEL – A DANGEROUS 'GOOD' FOR GOOD REASON

A recent report to the CAA has illustrated the dangers of mishandling fuel.

A recent aviation-related concern* was reported to the CAA after the submitter watched a farmer filling old 20-litre pesticide containers with jet fuel for an agricultural pilot.

Why should this be a 'concern'? Well, there are several problems, including that the fuel may degrade the container material.

There's also the danger of residual pesticide or other contamination remaining in the container, mixing with the fuel – even the water used to clean the contaminant out, can then itself be a contaminant.

If you use non-standard jerry cans, the fuel can degrade the gasket in the cap making it brittle to the point where it disintegrates.

According to the Good Aviation Practice booklet, *Fuel management*, the fragments could then be "tipped into the fuel tank along with fuel. Over time [they] can either clog the tank outlet or the fuel system filter(s). Or [they] can turn to mush... also resulting in clogging of the filter".

Because of the lethal danger presented by fuel if it's stored and/or carried improperly, there are lots of musts and shoulds in its handling.

Carriage of fuel in aircraft

Regardless of whether it's Jet A-1 or Avgas, or the purpose for which it's being carried, it's regarded as a dangerous good (DG) – and it must be carried in accordance with Part 92 and with the *ICAO Technical Instructions*. This applies to all flights, regardless of whether they're private or commercial, or what flight rules they're operating under.

One of the requirements is that fuel be carried in containers specifically designed and manufactured to carry fuel.

Plastic jerry cans intended for use with fuel are acceptable.

They must be less than five years old, and approved for carriage by air. That's indicated by the UN code stamped or embossed on the container, which will look something like:

UN 3H1/Y/1.4/150/20/NL/VL824

If your container doesn't have a code like this, it cannot be used for carrying fuel on aircraft.

If you're a certificated operator, your exposition must include your DG procedures.

Similar requirements apply to the road transport of fuel. For instance, containers must be designed specifically for carrying fuel, plastic containers must be no more than five years old, and if the type of fuel carried in a particular container changes, be very, very careful in cleaning the container first. The containers must be marked and labelled identifying the fuel being carried.

Comments or queries?
Email **jim.finlayson@caa.govt.nz.**

// UPDATED POSTER

On the back cover of this issue of *Vector*, you'll find our updated dangerous goods poster. You can cut it from the magazine and use for future reference, or email **publications@caa.govt.nz** for your free copies, available in both A4 and A3 sizes.

* aviation.govt.nz/safety/aviation-concerns/

LOOKING WITHOUT SEEING

// By Alaska White*, CAA Chief Advisor, Human Factors

Inattentional blindness is psychology's way of describing not seeing what's right in front of you. It's a deadly threat to aviation.

Photo: iStock.com/18percentgrey

* Alaska White, MSc Human Factors and Aviation Psychology (Distinction) University of Otago, 2018.

Attention is your ability to focus, and maintain focus, on an object, event, or task.

We can't focus on every object, event, or task around us, however, because our brains have limited capacity to 'pay attention'.

That means that at any one time, we process only a small amount of the information – both what we're seeing and what we're hearing – beaming in from our environment.

Ideally, therefore, we concentrate on those things we believe are significant to us and our goals, and we filter out the 'noise'.

Distraction

But sometimes it's the 'noise' that captures our focus – literally, if it's a cellphone ringing – when we're trying to concentrate on an important task. This is basically what 'distraction' is.

Minor or major distractions can turn any routine operation into a challenging situation.

In aviation, for example, this could happen when listening to, understanding, and responding to radio communications, or looking out for other aircraft in the same airspace, while at the same time trying to find a pen that's fallen to the floor and disappeared.

It's obvious that in aviation, being distracted from a primary task and missing important and critical changes in your immediate environment can have deadly consequences.

The United States crash of Eastern Air Lines Flight 401 in 1972 is classic example. All three pilots on the flight deck became utterly focussed on a burned-out landing gear light and failed to notice the autopilot had been disconnected.

The Lockheed L-1011 TriStar gradually lost altitude and crashed into the Florida Everglades, killing 101 of the 176 onboard.

Not all distraction is bad. If an alarm distracts us from our current task but make us focus on a more important one, that's obviously a good thing.

But distraction is a hazard when it leads to inattentional blindness.

Inattentional blindness

It's logical to assume that you consciously see whenever your eyes are open, but this isn't the case.

Inattentional blindness – IB – is a failure of visual attention. It's different to distraction because with IB we fail to notice prominent and unexpected changes in our environment unless our attention is directed to it.

In complex environments or situations where our attention needs to be focused on one important task (or object) – or shifted between multiple tasks – our awareness decreases of objects or events not in our direct focus of attention.

Have you ever been wondering where your keys are and you're staring straight at them? Or looked for your cellphone using your cellphone torch? »

Photo: iStock.com/busracavus

// Distraction is a hazard when it leads to inattentional blindness.

We're also all affected by 'inattentional deafness'. (It's not just teenagers.)

One of the best-known experiments used to demonstrate IB was the 'invisible gorilla' experiment, where participants watched a video of a group of people tossing a basketball and had to count the number of passes. More than half of participants reported seeing no changes, but in fact a woman dressed in a gorilla suit strolled through the scene, turned to the camera, thumped her chest, and walked away. It may seem impossible that participants missed such an obvious and strange sight. Some participants were looking right at the gorilla but not seeing it because all their attention was directed to the task of counting the passes and the gorilla essentially became completely invisible.

IB is not uncommon and everyone will experience it in their daily life more often than they realise.

But in a safety-critical and high-risk environment like aviation, an inability to detect unexpected changes in the visual environment is a major safety hazard, and can lead to serious incidents and accidents.

In practice, if automated systems fail and attention is drawn away from the primary task and the surrounding environment, the consequences could be:

- one or more incomplete tasks, such as a preflight check
- impaired situational awareness inside and outside the cockpit
- air traffic control displays not monitored due to disruptions in visual scanning
- not detecting, or misinterpreting, critical information – for instance, missing radio calls or instructions from ATC
- increased time dwelling (for instance, on displays) and incorrect or delayed decision-making
- standard operating and emergency procedures not followed.

Other consequences could include:

- impaired vigilance and signal detection, from, for instance, other aircraft in the same airspace
- impaired dual task performance – for example, scanning instruments and giving instructions to the crew
- slower detection and diagnosis of problems such as a faulty warning light
- delayed recognition of, or a failure to detect, threats, errors, hazards, and critical events at all – weather changes being a prime example.

// ...an inability to detect unexpected changes in the visual environment is a major safety hazard, and can lead to serious incidents and accidents.. //

The consequences listed to the left lead to increased reaction times to detect and diagnose problems, adapt to system changes and proceed with the correct operations.

In an emergency, however, any additional seconds to respond to detected changes could be the difference between life and death, and cases where attentional failures have prevented pilots from noticing critical events are abundant.

What affects attention?

- Under high workload – such as landing at a busy aerodrome – the brain has too much information to process, is overwhelmed, and struggles to prioritise tasks.
- When workload is too low – such as in a highly automated cockpit – the brain has trouble attending to the task because of a lack of stimulation causing the 'boredom factor'.
- Stress affects focus and the brain's ability to make quick decisions is lessened – this includes home and work stress.
- Poor sleep – perhaps as a result of irregular work shifts – may impair your ability to maintain focus on tasks.
- Working on a cognitively demanding task for long periods of time – for instance, boroscoping a 'hot' section of a turbine – the brain will often experience mental fatigue.

- Confusing, unclear, irrelevant, or low-quality information and communication – muffled radio calls for instance – impair our ability to focus on tasks and make quick and efficient decisions, set goals and prioritise tasks.
- Automation in modern aircraft, and reliance on it, can lead to complacency, and can easily diminish situational awareness if you don't have, and maintain, oversight of critical systems.

How can attention be improved?

Rest! Take breaks. Attentionally demanding tasks, such as in aviation, use a lot of brain power and energy. It's unrealistic to expect yourself and your colleagues to be engaged in cognitively demanding tasks and sustain attention for long periods of time, yet still perform at 100 percent. Attention wanes over time and the brain gets tired and needs rest.

Follow standard operating and emergency procedures. To minimise distractions and disruptions, communicate early on with your crew or colleagues about roles and responsibilities, expectations of behaviour, key tasks, and priorities.

Prioritise and focus on key tasks to manage workload, share the workload where possible and appropriate.

Speak to your manager and/or colleagues and seek support if you're feeling tired, stressed, overwhelmed, or fatigued. These all affect your ability to focus on tasks and information, and increase the likelihood of making errors.

Being able to manage attention is a skill that needs to be maintained. Experience improves your ability to identify, understand, and manage tasks and different systems. Even experts are prone to attentional failure, becoming distracted and making mistakes. Keep current and keep learning.

When it comes to distractions, acknowledge that you may have control over some and not over others.

If you're faced with distraction, you need to quickly decide whether what's trying to get your attention is relevant to the task and a priority, whether it can wait, or can be disregarded altogether.

Comments or queries?
Email **alaska.white@caa.govt.nz**

// DOES THIS SOUND FAMILIAR?

CAA Flight Operations Inspector Pete Gordon knows a thing or two about being blindsided by distraction and inattentional blindness. Flying helicopter long-line extreme precision work in Papua New Guinea in difficult areas and at high-density altitude, his intense concentration was once completely undone by receiving a radio call about "…the weather up there, Captain?"

"I didn't even answer the call. Just acknowledging, somewhere in my brain, that the call had happened was enough to have guys on the ground who were guiding me in this exacting work '…just two inches to the left Captain…' wondering what on earth had me suddenly unable to follow their pinpoint instructions. 'We said two inches, Captain! Two inches!'"

Similarly, in New Zealand, using a lightbar and GPS to make lovely straight spraying lines across a block, Pete answered his wife's call on his cellphone, "And within seconds, I was seven metres off the line! Even though I was following the lightbar, I'd become distracted by our conversation and not acknowledged what the light bar was telling me, allowing the helicopter to drift off by half a swath! I had to stop, turn around, and start again."

But his purest experience of IB, and the scariest, was flying a Huey helicopter in New Zealand, doing baiting work.

"The master caution warning light suddenly came on, so I looked down at the warning panel, and there was an oil pressure warning light showing. And that is not good.

"I needed to confirm what it was telling me with the oil pressure gauge – something I see innumerable times each hour as I do a scan across the instrument panel.

"But I could not find the gauge. I could not see it on the panel. It just wasn't there.

"So I put the machine on the ground, and once landed, there, on the panel in its usual place, was the oil pressure gauge, confirming what the red light warning was saying. Zero oil pressure.

"But clearly, my brain had been well-stressed, my mind was not accepting what was going on and the gauge was invisible to me."

LETTERS TO VECTOR

Dual controls

The article *Dual controls* in *Vector* (Summer 2021-22) is clearly subtitled, "Installation and removal of dual controls is not routine maintenance and cannot be carried out by a pilot under a Part 61 licence".

Does this apply to aircraft with easily removable control sticks? Aeroplanes such as Austers, Tiger Moths and Super Cubs come to mind, as do R22 helicopters, where the simple removal of a pin allows the non-pilot's stick to be removed, usually so that a passenger cannot interfere with the controls in flight.

Replacement of the stick and pin in a matter of seconds allows the second set of controls to be re-established. Does this action then require the inspection of an engineer or person with a certificate of maintenance approval, and a logbook entry, before the aircraft is deemed fit to fly again?

I suggest that a person who has demonstrated the necessary determination, skills and knowledge to earn a pilot's licence can be trusted to perform this simple act.

John King,
Editor NZ Aviation News

CAA Chief Advisor, Airworthiness, Warren Hadfield replies:

Thanks for your letter to *Vector*, John. As you will be aware, duplicate inspection requirements are an important safety control, with the requirements for duplicate inspection applicable, regardless of the complexity of the system involved.

While we understand that there are aircraft where the removal and installation of dual controls is a simple process (often a design feature whose intent is increased safety) the consequence of failure of these systems means that the risk involved is high.

I'm sure you'll be aware of instances where a simple process to remove and install dual controls (or other role equipment) has resulted in safety of flight issue. In fact, the event which triggered this particular *Vector* article represented a simple control removal on one of the aircraft [you quote]. It was clear from that event that (in the case of the two pilots involved at least) there was a lack of understanding of Part 43 as it pertains to dual controls, and the significance of maintenance on control systems.

Given the importance of the topic, it is disappointing that the tone of the article has been received as CAA not trusting pilots, rather than its intent, which was clarifying previously incorrect CAA comms, safety of flight, and pilot responsibilities.

To address your question – for aircraft subject to Part 43, all maintenance carried out must comply with Part 43 requirements including duplicate inspections where necessary, and release to service. These requirements include the recording of maintenance.

The intent of the maintenance approval process (if this is the path chosen) is to ensure that the person carrying out the maintenance is assessed as competent (knowledge, skills, attitude) to carry out the specific task IAW Part 43.

// DEAR VECTOR...

Reader comments and contributions on aviation safety are welcome. Email **vector@caa.govt.nz** or the specialist whose name appears at the bottom of most articles. We may edit or shorten letters, or decide not to publish.

BACK TO THE FUTURE WITH *VECTOR* PACKAGING

With soft plastic recycling gaining momentum once more, we're returning to this form of packaging for *Vector*.

In the Spring 2020 issue of *Vector* we told you about our distributor's move away from soft plastic and towards a plastic-like material that was degradable when exposed to environmental conditions, like ultraviolet light.

The latest debate is, however, that the microplastics remaining from this process still have an impact on the environment. The government is intending to phase out this material by late 2022.

So our distributor is moving to 100 percent recyclable soft plastic. This is because onshore processing is now available in New Zealand, turning this material into things like planter boxes and fence posts.

Check out **recycling.kiwi.nz/our-story.**

Or if you prefer, you can email **vector@caa.govt.nz,** cancelling your subscription to the print version of the magazine and catch up with it instead at **aviation.govt.nz/vector.**
You can subscribe to get a notification as each issue is published on the website – go to **aviation.govt.nz/subscribe.**

SOFT PLASTIC RECYCLING

OCCURRENCES DASHBOARD

These are the number and type of occurrences reported to the CAA, 1 January 2022 to 31 March 2022.

Occurrence type

22	**Aircraft accident**
29	**Aerodrome incident**
402	**Aviation-related concern** (for example, complaints about low flying)
367	**Airspace incident**
357	**Bird strike**
207	**Defect**
7	**Dangerous goods occurrence**
9	**Hang glider accident** (includes 5 paragliding accidents)
271	**Operational incident** (anything not fitting into any other category – for example, a go-around)
24	**Navigation installation occurrence** (for example, a transmitter failure)
6	**Parachute accident**
6	**Promulgated information occurrence** (for example, inaccurate weather information)

AVIATION SAFETY ADVISORS

Contact our aviation safety advisors for information and advice. They regularly travel around the country to keep in touch with the aviation community.

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

Mark Houston – Operations, North Island
027 221 3357 / mark.houston@caa.govt.nz

Neil Comyns – Maintenance, South Island
027 285 2022 / neil.comyns@caa.govt.nz

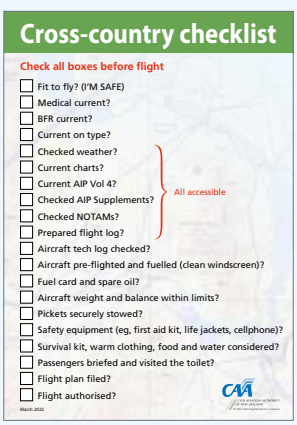
Carlton Campbell – Operations, South Island
027 242 9673 / carlton.campbell@caa.govt.nz

SAFETY EDUCATION PRODUCTS

Did you know that in addition to our *Good Aviation Practice* booklets, and posters, you can order this range of refreshed safety education products from us?

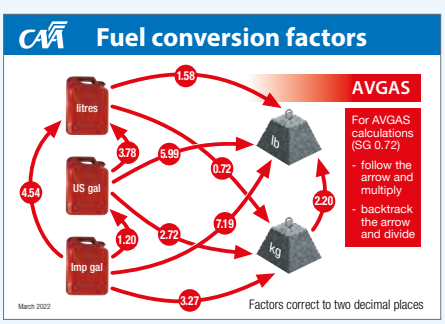
// REQUEST YOUR FREE COPIES

Just email **publications@caa.govt.nz** to request your free copies of any of these products.



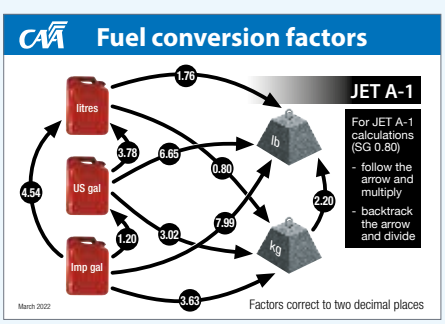
Cross-country checklist

A6 size, with 25 sheets



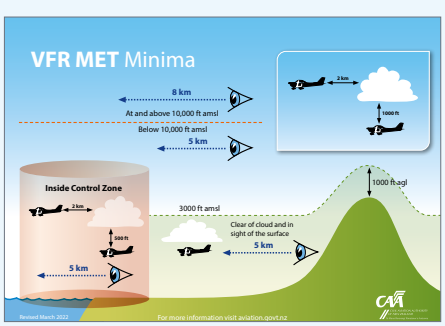
Fuel conversion factors sticker – Avgas

A7 size, adhesive



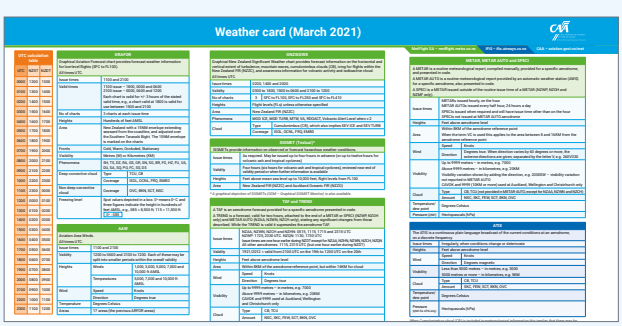
Fuel conversion factors sticker – Jet A-1

A7 size, adhesive



VFR MET Minima card

A5 size, hole-punched to fit in your AIP Vol 4.



Weather card

Folds to A5 size, laminated and hole-punched to fit in your AIP Vol 4.

AIRSPACE OCCURRENCES

Airspace occurrences can be read on the CAA website, **aviation.govt.nz > safety > airspace occurrence briefs.**

Date and time:	12-Sep-2021 at 03:45 UTC
Location:	Matamata

A light aircraft lined up and took off while a glider was landing. Neither crew member of the light aircraft saw the glider or heard any radio calls from it, while the glider crew did not hear the light aircraft advise it was lining up. The front seat glider pilot reported he saw the light aircraft when it climbed up ahead of him as he was about to land.

The investigation found that an inadequate lookout by the light aircraft crew before entering the runway was a primary factor in this occurrence. The absence of any radio calls also reinforced their belief there was no circuit traffic. The investigation also noted that the light aircraft's line-up call was of a much lower transmission strength than its previous radio call, which may have contributed to it not being heard by the glider crew.

Another identified factor was that the glider's front seat radio transmit button had an intermittent fault, and therefore its radio calls were not heard.

The light aircraft operator now further encourages the need for pilots to thoroughly scan final approach for any traffic, especially for those that may be flying a different approach path, or NORDO aircraft, before taxiing on to a runway.

The glider's front seat radio transmit button has since been replaced.

CAA occurrence number 21/5136

Date and time:	04-Mar-2022 at 02:45 UTC
Location:	Hokitika

A Hokitika aerodrome runway inspection officer heard a King Air making radio calls within the MBZ including that it was on final for runway 03. The officer then happened to look at final approach for runway 30 and saw a light aircraft on final for that runway too. He had not heard any radio calls from that aircraft, so he used his radio to alert the King Air crew of the conflict and they immediately executed a go-around.

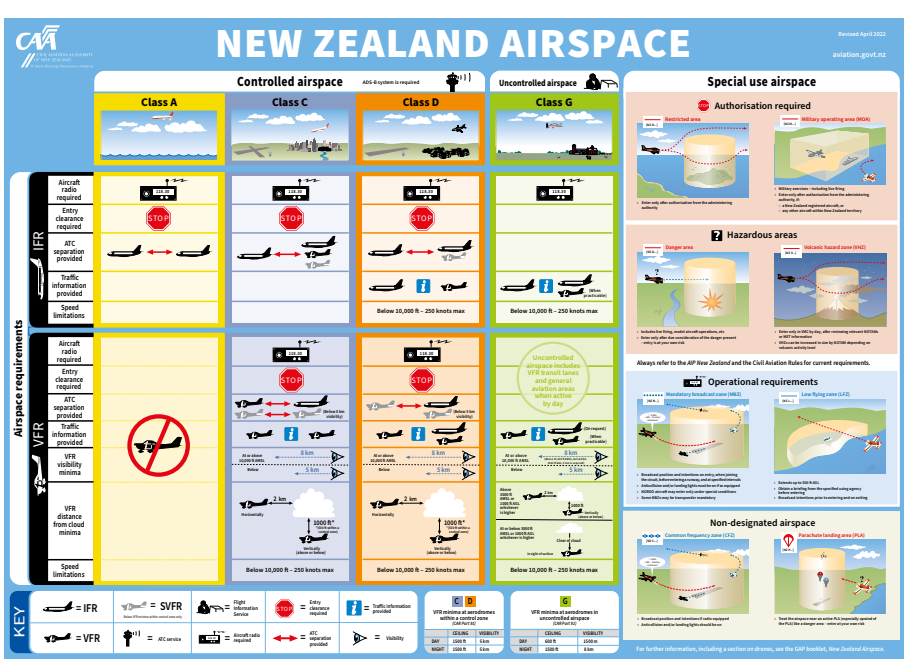
The officer approached the light aircraft pilot after the aircraft shut-down and inquired about the absence of radio calls. It was at this time that the pilot realised he had used his out-of-date AIP and therefore the wrong frequency. He had used the old frequency (119.1) rather than 119.8 which is the correct frequency (from Feb 2022). This was despite having current maps and using a 'popular' navigation app on his phone.

The CAA investigation found that the pilot has since updated his hardcopy AIP and is having ADS-B fitted in the aircraft later this year. He will also pay more attention to his flight planning in future.

A similar incident has happened since this one and it appears that some pilots, when using navigation apps on mobile phones, may be zooming in to see more map detail but by doing so, inadvertently moving other information off the screen.

The CAA is currently focussing on incidents where a lack of flight planning or insufficient flight planning has led to occurrences.

CAA occurrence number 22/1311



You can get your free copy of the revised and updated *New Zealand Airspace* poster from one of our aviation safety advisors (contact details on page 23), or by emailing **publications@caa.govt.nz**.

ACCIDENT BRIEFS

More accident briefs can be seen on the CAA website, **aviation.govt.nz** > **safety** > **aircraft accident briefs**. Some accidents are investigated by the Transport Accident Investigation Commission, **taic.org.nz**.

Tecnam P92 Echo Classic UL

Date and time:	28-Apr-2021 at 11:30
Location:	Glentui
POB:	2
Nature of flight:	Training dual

An instructor was teaching a simulated forced landing without power exercise, followed by an engine failure after take-off exercise. During the engine failure after take-off demonstration, at around 30 feet, the aircraft clipped powerlines, departed controlled flight, and then impacted terrain in a nose-down attitude. The aircraft came to a rest approximately thirty metres past the powerlines. There was significant damage to the aircraft. The instructor and student sustained serious injuries but were able to get out of the aircraft. The property owner and a neighbour attended to the pilots until rescue services arrived. Both pilots required hospital treatment for their injuries.

The investigation into the accident identified that there were few visual cues available to the pilots to alert them to the presence of powerlines. The power poles were largely obscured behind a hedgerow and the lines across the hedge gap were very difficult to see against a background of farmland, trees and distant hills.

The investigation also identified that the instructor was not following recommended lesson structure guidelines provided by either RAANZ or the CAA and was teaching an advanced lesson to a beginner pilot. While not considered directly contributory to the accident, in conjunction with another microlight accident a few months later in Masterton, it highlighted that some microlight instructors were not following good instructional technique in the delivery of flight instruction.

The investigation further identified that for early-stage training, the instructor had descended lower than was considered necessary to determine the success of the exercise. The club has introduced a 200 ft minimum for the practice of simulated engine failure exercises conducted off-aerodrome.

As a result of this investigation, the CAA is reviewing the currency of Legal Information Bulletin Number 1, which provides an interpretation of CAR 91.311, *Minimum Heights for VFR Flights*. As the bulletin was initially issued in 2004, the CAA review aims to provide up-to-date guidance on what it considers to be bona fide reasons for conducting flight training below 500 ft.

A full report is available on the CAA website.

CAA occurrence number 21/2368

NZ Aerospace FU24-950

Date and time:	11-Feb-2022 at 06:25
Location:	Te Kuiti
POB:	2
Nature of flight:	Agricultural

The pilot departed just after morning civil twilight (MCT) for a short ferry flight to a local farm airstrip. The environment was still very dark due to cloudy conditions as the aircraft flew around and surveyed the area. The pilot identified what he thought were wheel marks from the previous day and lined up on them. Unfortunately, the marks were not wheel marks and soon after landing the aircraft collided with a fence line which sheared off the left outer wing before the aircraft slew around and came to a stop. Major damage was caused to the aircraft but neither occupant was injured.

The operator's investigation concluded that the "inexperienced pilot's decision to depart immediately after MCT on an overcast dark morning, while legal, was not the best decision given the prevailing dark lighting conditions".

CAA occurrence number 22/741

Piper PA-28-181

Date and time:	22-May-2021 at 10:23
Location:	Raglan
POB:	3
Nature of flight:	Private other
Pilot licence:	Private Pilot Licence (Aeroplane)
Age:	31 yrs
Flying hours (total):	192
Flying hours (on type):	15
Last 90 days:	6

On landing, the aircraft slid on damp grass and came to a halt with the port wing through the end fence at the corner of the airfield (off the centreline).

The aircraft's approach was normal; the aircraft floated for a bit between the flare and touchdown point, but by then the pilot was committed to landing, as a go-around was not possible by the end of the float.

The pilot acknowledged that they need to be more respectful of wet grass and that an early go-around decision point may have helped.

CAA occurrence number 21/2940

GA DEFECTS

GA defect reports relate only to aircraft of maximum certificated take-off weight of 9000 lb (4082 kg) or less. More GA defect reports can be seen on the CAA website, **aviation.govt.nz > aircraft > GA defect reports**.

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

Piper PA-28R-200

Hydraulic pump motor

Part number:	105476
TSI hours:	18563

During a dual flight for type rating purposes, when the landing gear was selected down for landing, the landing gear failed to extend.

The crew carried out the emergency extension procedure which was successful, then landed with no further issues.

The maintenance investigation found that the landing gear hydraulic pump motor was intermittent in operation. A replacement pump assembly was ordered.

CAA occurrence number 21/2255

Cessna A152

Forward bellcrank fuselage brackets

Part manufacturer:	Cessna
Part number:	0411289-1 & 0411290
ATA chapter:	2700
TTIS hours:	17540.26

During a 100-hour inspection, cracks were found on the elevator forward fuselage support brackets P/Ns 0411289-1 & 0411290. These form the support structure that holds the pivot bolt for the bellcrank assembly. The maintenance provider suspects that the cracking is due to fatigue over time. The cracked brackets were replaced.

Following the report of this defect to the CAA, *Continuing Airworthiness Notice 27-017 Cessna 150 and A152 Elevator Bellcrank and Bracket Assembly* was issued on 07 Aug 2020. The continuing airworthiness notice (CAN) draws attention to the area concerned and the potential for cracking of the bellcrank support brackets. The CAN also requests that any defects found also be reported to the CAA.

CAA occurrence number 20/3837

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.

Piper PA-34-220T

Piston

Part model:	TSIO-360-KB11B
Part manufacturer:	Continental
ATA chapter:	8530
TSO hours:	1525.25
TTIS hours:	6081.99

On climb through 6500 ft, a loss of power in the left engine occurred with a 5" manifold pressure (MAP) reduction. The pilot conducted the primary drills and noted that the oil pressure on the left engine indicated low (still in green range) and that the oil temperature was indicating quite high (also still in green range).

The pilot elected to reduce power on both engines to 31" MAP and open the left cowl flap until top of climb and continue monitoring the situation. On reaching 8000 ft the pilot reduced power to 25" MAP. The pressure and temperature had returned to more or less normal indications with the cowl flap open. The throttle levers did not match up on an equal power setting being offset by less than 1 cm in position. As the aircraft cruised and held height well, the decision was made to continue the flight to NZTI as it was due there for maintenance. The pilot was able to land at NZTI without further incident. After landing, the pilot observed a fair amount of oil on the trailing edge of the left engine nacelle and wing.

During the maintenance investigation, a cylinder leakage check found that the #2 and #3 cylinders had high leakage with the #2 cylinder 45/80 and #3 cylinder 0/80. The two cylinders were removed, the #2 was found to have a high leakage past the exhaust valve. The electrodes of both spark plugs fitted to the #3 cylinder were completely bridged by metal particles from the crown of the piston, and one had a broken ceramic insulator. The piston itself was severely degraded with the circumference of the crown completely eroded from the top to the top ring land. There was some damage down the sides of the piston where some metal migrated past the rings and scored the cylinder and piston sides.

The cause for this failure is thought to be pre-ignition/detonation, possibly caused by a hot spot developed on, or from, a faulty spark plug escalating to the piston failure.

CAA occurrence number 21/1854

Dangerous goods

KEEP YOURSELF SAFE. ASK YOUR AIRLINE.

LPG bottle

Lighter fluid

'Strike anywhere' matches

Fireworks

Corrosives and poisons

Blue flame and single-action lighters

Batteries and powerbanks

Camp stove

Ammunition

E-cigarettes, lighters and safety matches

Aerosols

Chainsaw and other tools

Items like these can be dangerous in the air. They might be prohibited and taken off you before you board. Some items might be allowed if packed correctly. Avoid prosecution. **Ask your airline for advice.**

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

Te Kāwanatanga o Aotearoa
New Zealand Government

For more information, visit **aviation.govt.nz/what-can-i-bring**

March 2022