

# vector



What  
engineers  
would like  
from pilots

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Tips from  
the newbies

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Straying  
from  
standards

## TAKING OFF IN A HANG GLIDER OR PARAGLIDER



8

**// WHAT ENGINEERS WOULD LIKE FROM PILOTS**

Cover: New Zealand is an increasingly popular place for overseas hang gliding and paragliding tourists. Some of that is driven by the success of New Zealand flyers in international competitions. See story on page 4. Photo of a paramotor courtesy of Simon Enderby.



13

**// TIPS FROM THE NEWBIES**



16

**// STRAYING FROM STANDARDS**

# In this issue...



4

**// TAKING OFF IN A HANG GLIDER OR PARAGLIDER**

From the Director .....	3	Daily flight records .....	12	Aviation safety advisors.....	25
Have your say on the Civil Aviation Bill .....	3	Tips from the newbies .....	13	How to get aviation publications.....	25
Free Met ebook for PPL students .....	3	Straying from standards .....	16	Planning an aviation event? ....	25
Taking off in a hang glider or paraglider .....	4	Who 'does' SMS at your place?..	20	Accident briefs.....	26
What engineers would like from pilots.....	8	Service bulletins and you .....	22	GA defects.....	27
Clarification.....	10	Sparking knowledge of fuel chemistry.....	23	Aviation Safety Officer course .....	28
Noise .....	11	Sector risk profile update .....	23	Airworthiness and Maintenance Workshop.....	28
		New and updated products ....	24		
		Flight instructor seminar 2019 ..	25		



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**From the  
Director** //

Welcome to the winter edition of *Vector*. As our days draw shorter and frosts start to bite, it's well worth reading our story on page 23 about how carb icing, with subsequent reduction in engine temperature, can lead to spark plug fouling, and ultimately unexpected power loss.

Winter is also a great time for operators working toward certification of their SMS (safety management systems) to make progress. With just over 18 months until the final date for SMS certification, it's important for our smaller operators to continue working towards implementation and certification.

On page 20 you can read about Air Milford's move to SMS, which explores how the operator has adapted to SMS and how the framework has complemented their day-to-day safety activities.

In April I was pleased to sign the Authority's new Colour Vision Deficiency (CVD) General Direction.

The Direction, which came into effect on 31 May, followed three years of close work with industry, and an expert panel, who considered international evidence and possible changes to screening.

That evidence found most pilots with CVD who had passed an effective screening test, posed no greater safety risk than non-CVD impaired pilots. The Direction provides for such a test – an operational colour vision assessment (OCVA) conducted by a Category A instructor.

While aviation safety will not be compromised, pilots with CVD who pass an OCVA will face reduced barriers to employment.

To find out more about the General Direction and the new three-phase screening process, visit [www.caa.govt.nz](http://www.caa.govt.nz) "Aviation Info > Medical > General Directions".

Regards,

Graeme Harris



## HAVE YOUR SAY ON THE CIVIL AVIATION BILL

The Ministry of Transport has released a draft of the Civil Aviation Bill.

The draft Bill would replace the Civil Aviation Act 1990 and the Airport Authorities Act 1966 with a single statute, and includes a number of proposals to improve the safety, security, and efficiency of our entire civil aviation system.

Proposed changes include a drug and alcohol management scheme for commercial aviation operators, and incorporates the principles of Just Culture in the reporting of aviation incidents.

To learn more about the Civil Aviation Bill, and how to make a submission, visit the Ministry of Transport website:

**[transport.govt.nz/air/civil-aviation-bill](https://transport.govt.nz/air/civil-aviation-bill)**

Submissions close 6 July 2019.



## FREE MET eBOOK FOR PPL STUDENTS

As well as helping you pass your PPL Meteorology examination, this ebook should give you the tools to make sound weather-based decisions.

There are 21 chapters reflecting the PPL Met syllabus (Subject No 8, Advisory Circular AC61-3). The ebook is specially written for the Southern Hemisphere.

For a link to the ebook visit:

**[caa.govt.nz/met](https://caa.govt.nz/met)**

# TAKING OFF IN A HANG GLIDER OR PARAGLIDER



Hang gliding and paragliding ‘wings’ are increasingly populating New Zealand’s skies. If you fancy a go, here are the safety – and other – considerations, of taking off in foot-launched, free flight.



**B**etween 2012 and 2017, membership of the national hang gliding and paragliding body grew 150 percent (734 to 1,120).

International visitor membership grew more than 400 percent (52 to 222).

That national body – the New Zealand Hang Gliding and Paragliding Association (NZHGPA) – says the country is an increasingly popular place to visit for hang gliding and paragliding tourists. It says some of that is due to Northern Hemisphere pilots coming here in their off season. Publicity around the success of New Zealand flyers in international competition, and the beauty and challenge of flying in remote mountains are also drawcards.

Most pilots enjoy their flying within a short distance of the launch place – soaring coastal cliffs or familiar mountains, to enjoy the view and the freedom of the air.

Some explore further afield on long cross-country flights that can cover hundreds of kilometres. The current New Zealand distance record is more than 235 km.

A small number of experienced and adventurous pilots, who are appropriately trained and rated, embark on ‘hike and fly’ expeditions. Pilots tramp into the mountains carrying a lightweight paraglider – about 8-10 kg – to find a suitable place to launch. They need lifting air, allowing them to gain height and fly some distance to a safe landing.

They have to take into account many factors – from land access and airspace rules, to weather and terrain influences – to do these flights safely and legally. They should carry lightweight instruments with GPS tracking and satellite communications for safety and to provide a flight log.

## // Fly according to experience, and build skills – and thrills – slowly. //

Their landing place can be on top of another mountain, where the pilot will camp overnight and fly again the next day. Or it may be in a valley with the prospect of a big hike to find another launch site. In good weather, the top pilots have covered the whole length of the Southern Alps in this way, in just a few days.

By far the more popular of the two forms of gliding is paragliding and speedwing flying. There are four paragliding members to every one hang gliding pilot. It’s easier and quicker to learn, the paraglider is more compact to transport, and there are many more available launch sites.

Hang gliding, however, offers higher performance. It’s faster, and has a better glide ratio and a more direct connection between the pilot and the wing. To many people it’s ‘real’ flying.

You cannot fly on your own in New Zealand without a pilot certificate issued by the NZHGPA. It also certifies powered versions of ‘foot-launch’ aviation such as powered paragliders (or paramotors) and powered hang gliders.

If you want to fly for hire and reward, you must become certificated under Part 115 of the Civil Aviation Rules.

### Where to start?

The NZHGPA’s Evan Lamberton says would-be flyers in New Zealand are fortunate to have many well-run schools, a list of which is on the NZHGPA web site, [www.nzhgpa.org.nz](http://www.nzhgpa.org.nz).

Evan says it’s important the aspiring hang gliding or paragliding pilot find an instructor they both trust and like. »

“Talk to an instructor. Try to go out when they are teaching. The instructor stays on the ground and directs the student via radio so you can see how they teach. Decide if you are happy with that, before you commit to buying your gear and training.

“Because the instructor is on the ground, hang gliding and paragliding are the only flying sports where you solo from day one. There needs to be a connection between instructor and student so the novice pilot will trust the instructor to ensure their safety.”

Students begin with ‘skimming flights’ where they fly shallow glides, low to the ground, getting used to the controls. They move on to soaring, and simple mountain flights, all under instruction via radio.

“Some instructors offer tandem flights as part of the training and this is a valuable experience, but the basics of glider control are learned solo with the instructor on the ground guiding you through it.

“A one day package normally includes an introduction to the equipment set-up and safety checks, basic glider control, and solo flights from a low hill, and a tandem flight with an instructor.”

Some people catch the bug of hang gliding and paragliding by flying a tandem flight with a Part 115-certificated commercial operator, most of whom are based in Queenstown.

“Gaining a paraglider pilot certificate,” says Evan, “can be done in 7 to 10 days if the weather obliges and the student has time to fly every day. But most students take a month or two in the summer season to qualify.”

Many commercial paragliding training operations will heavily discount tuition fees if the student buys their equipment from the operator: a learner-rated wing, harness, and helmet.

“With the longer time frames required for hang gliding training there are fewer commercial schools but great support for new pilots from local club instructors.”

## How dangerous?

Like all adventure flying sports there’s an element of risk, and with or without power, the risk lies with the pilot’s ability and decision-making.

“That’s about choosing the right equipment,” says Evan, “and the right places to fly. The ‘right’ weather conditions depend on the skill of the pilot, so the pilot needs to choose those wisely.”

Due to their low airspeed and sensitivity to turbulence, hang gliders and paragliders can be flown only in light winds – paragliders up to 15 kt, and hang gliders up to 25 kt.

Most pilots, however, factor in a margin of safety, and won’t fly in winds more than about 5 kt below those upper limits, although that too depends on the surrounding terrain. In completely flat terrain, very skilled pilots fly in strong winds to achieve world record distances over 500 km.

Most pilots fly safely, and the NZHGPA is working hard to emphasise the importance of that. It publishes a no-blame page on its website where flyers can describe an incident they were party to. That’s done in the interests of spreading the word.

“Risk depends on how a pilot wants to fly,” says Evan. “I like to compare it to mountain biking where the degree of risk you can choose to expose yourself to, goes from a trip to the local shops, to downhill racing.

“The risk also increases dramatically during ‘speed flying’. The pilot uses a wing, half the normal size, and flies at low level, often faster than 70 kilometres an hour. It’s a thrill but that thrill sometimes comes at a cost.”

The NZHGPA’s campaign for safe flying is up against some newer pilots who – despite a lack of experience – try to recreate YouTube footage depicting very experienced pilots speed flying, or skimming cliff faces by inches.

“That’s a real headache for us. When someone is hurt or killed, it’s tragic, and makes the sport look more dangerous than is the case,” says Evan. His advice is to fly according to experience, and build skills, and thrills, slowly.

Hang glider and paraglider pilots often fly over difficult and remote terrain, so the CAA strongly advises the use of a PLB (personal locator beacon). Organisations should remind all pilots of this, including visitors from overseas.



// This hang glider is being aero-towed by a microlight aircraft. Photo courtesy of Ross Gray.



// The youngest competitor at the 2019 paragliding national championships, 16-year old Sam Hamill, is here launching from the top of Mt Murchison. Photo courtesy of Janice Lamberton.

## Operations and limitations

Under Part 106 *Hang Gliders – Operating Rules*, a paraglider is classed as a hang glider without a rigid primary structure. So both are covered under Part 106, with rules that include:

- carrying an accurate altimeter
- wearing a serviceable rigid protective helmet and a harness of a type that conforms to the standards of the NZHGPA
- the rig having a current warrant of fitness issued by the NZHGPA.

And an exception:

- a person may fly a hang glider below a height of 500 ft for ridge soaring, if such flight does not endanger people or property on the ground.

## Aircraft requirements

Both types of aircraft are susceptible to damage by sunlight. Although the synthetic materials are treated to resist sunlight, prolonged exposure eventually leads to weakness and increased porosity of the cloth. Hang gliders are longer lasting but have the additional considerations of a rigid frame, wire rigging and metal fastenings.

Hang gliders and paragliders therefore need an annual warrant of fitness (WOF) and regular checks. The WOF must be re-issued if the hang glider or paraglider is damaged, or substantially modified.

All WOFs are carried out by a hang gliding or paragliding inspector authorised by the NZHGPA. But the cost of these is kept down by many local clubs organising ‘WOF gatherings’ where members can assist in the checking of their own gliders, guided by experienced inspectors.

Once the annual check has been completed, a sticker is issued, and it must be placed on the glider in a visible spot.

## Flyer beware

Because hang gliders and paragliders are often sold on Trade Me and other websites, Evan Lamberton says novice hang gliding and paragliding pilots should get advice from their instructor.

“Buying your equipment through a school makes, by far, the best deal, because of the often cost-reduced training, and your instructor will make sure your gear is matched to you. Gliders have to be matched to the pilot by weight and skill level.

“Technology is changing in the sport, and buying old and possibly poorly maintained kit is fraught with potential issues.

“But if you’re going to go this route, always take advice from a certified pilot – preferably not the one who’s selling the gear.”

## More information

All rules, advisory circulars, and forms are available on the CAA website, [www.caa.govt.nz](http://www.caa.govt.nz).

Information on local clubs, schools, and memberships are available on the NZHGPA website, [www.nzhgpa.org.nz](http://www.nzhgpa.org.nz). ➔

# WHAT ENGINEERS WOULD LIKE FROM PILOTS

Better communication.



**P**ilots and aircraft engineers are co-dependents. Without engineers, pilots could not fly safely. Without pilots, engineers would have no job.

The contribution of each is safety-critical, and many engineers say their work would be a lot easier – and dare say, cheaper – if pilots would just communicate more, and more effectively.

Tauranga-based engineer Colin Alexander says nobody knows the aircraft better than the pilot.

“But it can be difficult to get an accurate report on defects and observations from them. Sometimes that’s because the pilot just parks the aircraft outside the hangar and walks away.

“It would help us engineers if they spent a few minutes discussing exactly what they are seeing and feeling when they fly.”

In 2016, CASA’s *Flight Safety Australia* magazine noted the following (hypothetical) conversation:

Pilot: *Something’s broken.*

LAME: *What, exactly?*

Pilot: *Not sure. Is it safe to fly home?*

LAME: *No, my crystal ball is also broken.*

The head of engineering at Canterbury Aero Club, Lyn Stead, agrees that communication between pilot and engineer is key.

“Talk to us, that’s the main thing. We can spend a lot of time trying to track down the source of a problem. If someone takes the time to describe what they see, feel, and experience, we get a much better idea of what the problem might be.”

Lyn says many of the pilots he deals with are students from overseas.

“So they don’t have the experience, nor sometimes the language, to explain what’s going on. In those situations, if they’re on the ground, or have another person in the cockpit, I suggest they take a video when the problem occurs, so we can see and hear what’s happening. That helps a heck of a lot.”

Colin Alexander says when a pilot returns to pick up the aircraft, it’s also helpful if they spend time with the engineer.

“It’s always worthwhile if a pilot allows a bit of time to find out what we did, inspect the work done, and discuss future maintenance.”

The engineers say it’s of benefit, for instance, if a pilot gives them a heads-up if the use of the aircraft is to change before the next scheduled maintenance check. For example, significantly more flight training could mean increased loads on the undercarriage.



**// It's always worthwhile if a pilot allows a bit of time to find out what we did, as well as to discuss further maintenance. //**

### **For want of a tech log...**

Know that proverb that starts, 'For want of a nail'? It's the cautionary tale about how seemingly unimportant oversights can lead to catastrophe.

A tech log is a key communication tool between pilot and engineer. Therefore, and not incidentally, it's an operator breach of rule 91.619 if an aircraft tech log is incomplete or inaccurate.

And yet, engineers say some aircraft are delivered to them where the accompanying tech log hasn't been touched since the issue date.

Rangiora-based engineer Pat Scotter says it's not the role of the LAME to play detective and try to trace unrecorded work. »



// Engineer Pat Scotter and pilot Robbie Meyer discuss an oil leak on Robbie's Piper Warrior.

“Engineers determine their work [order] based, in part, the information in the tech log. So as well as identifying the due dates of the next inspection and review of airworthiness, the log should note any other maintenance due before the next scheduled inspection.

“That might be something like a requirement to have the ELT battery changed, or complying with the instructions of an airworthiness directive.

“The operator must also record a progressive total of hours in service – and in some cases, cycles – ensuring that any maintenance items called up are attended to,” says Pat.

### Learning a bit about the engine

Lyn Stead says some pilots, owners, and operators have a natural interest in their aircraft’s engine. Others don’t.

“It wouldn’t hurt if they learned enough to do some troubleshooting themselves. For instance, rough running might just need the mixture leaned, or carb heat applied. Or they could test the mags by switching back and forth. That may fix the problem or at least isolate it a little more for the engineers.”

One of the more frequent problems Lyn sees is inexperienced pilots, in starting the engine, will over-prime it, flooding it, and causing it to backfire.

“Quite a lot of them don’t know what to do then, or are scared to do anything. They need to keep the engine motoring over so if there’s a fire in the induction system, it will draw it back into the engine.

“When they do nothing, a fire can ignite in the hot air box and round the air filter, and next minute they have smoke coming out of the engine.

“Not good for anybody’s nerves,” he laughs.

### Money and time

Lyn says if for no other reason, communicating properly with the engineer may save time and therefore money.

“Clearly, without a heads-up, it takes longer to find out what the problem is. You have to go through a certain process, resolve certain questions, and sometimes the aircraft has to be test flown to prove that (a) there is a problem, and (b) where it actually is. This takes time, and money.

“Some owners can say, ‘why did it take you so long to work out that problem was just a loose nut?’ But it maybe took two or three hours to track down that loose nut.”

Pilots can carry out some maintenance on their aircraft in accordance with rule 43.51. That includes being trained

// **It wouldn’t hurt if they learned enough to do some troubleshooting themselves. For instance, rough running might just need the mixture leaned, or carb heat applied.** //

by a LAME and authorised by the operator to carry out specific maintenance in Appendix A of Part 43.

Microflight maintenance must be carried out in accordance with rule 103.217.

But just because a pilot can legally carry out maintenance, it doesn’t, according to Colin Alexander, always means they should.

“Engineers tend to take a more ‘holistic’ approach to aircraft maintenance. They’re generally better at observing overall aircraft condition,” he says.

“For example, if a pilot is changing an oil filter, their total focus tends to be only on the oil filter, especially if it’s a relatively new task.

“The engineer, on the other hand, who’s doing this task every day, tends to pick up other defects while changing that oil filter. For instance, wires chafing, loose screws, and oil or induction or exhaust leaks.

“So having maintenance carried out by a professional could save pilots time and money in the long run.” ➔

### CLARIFICATION

In the Autumn 2019 *Vector* article, “All about IA holders”, we inferred that an IA holder is working under a delegation from the Director.

Although the IA certificate is issued by the Director, the work carried out by the IA holder is under the privileges of their certificate.

# NOISE

Pilots ignoring the effect of their activity on people below may well be ruining the field for everyone, including themselves.

The CAA receives complaints almost every day about aircraft noise over populated areas.

The tone of those complaints reflects residents' considerable frustration with aircraft they believe pay no mind to the effects of their activities.

Typical of such complaints are:

"Last night at 1:30 am a helicopter clattered low over my house waking me up. It took me another three hours to get to sleep again."

"In recent years there has been a marked increase in aircraft noise directly above our suburb, particularly in summer and on weekends."

"Last Saturday the noise was constant to the point of being intolerable – and we were eventually forced to leave our home for the day."

As airspace use increases, as population and tourism increases, the tolerance of affected parties on the ground is also being stretched.

If resident pressure is strong enough, pilots may find restrictions on their operations – curfews for example.

Unless it's related to low flying, the CAA has a limited role in relation to aircraft noise. However, there is the framework in place for the Authority to change or create rules to mitigate the nuisance, should community feeling be acute.

A former CAA policy advisor, Brigid Borlase, who has worked on aircraft noise, including responding to complaints, says reputational damage is hard to repair.

"It's not so easy to improve how locals perceive an operator that they believe is overseeing flights consistently blighting their way of life.

"It can also damage the reputation of the wider aviation sector.

"It's better for everyone, wherever possible, to fly neighbourly to prevent complaints in the first place.

"In some cases, it might be possible to let residents know ahead of time about a noisy activity. If they know to expect it, and that it will be for only a limited amount of time, they may be less stressed or concerned about the impact on them.

"If it does get as far as a group of residents complaining, it's important to acknowledge that residents and aviators will perceive noise differently.

"A sudden 20-second burst of noise can be annoying – even distressing – to people on the ground, but the pilot might think, 'It's only 20 seconds.'"

Residents can also perceive lower-level flying as being less safe.

The International Helicopter Association website has a *Fly Neighborly* guide which lists many good reasons why noise should be mitigated, and tips on how to treat complaints. Visit "[www.rotor.org](http://www.rotor.org) > Resources > Operations > Fly Neighborly".

CAA Aviation Safety Adviser, Carlton Campbell, says some training sessions naturally involve more noise, such as turning.

"In cases like this, 'share the noise' by moving to a fresh place every few minutes.

"If we want continued access to airspace, unconstrained by community pressure, we have to be aware of the considerable impact some of our flights have." ≡



# DAILY FLIGHT RECORDS

The flight record is the only log of an aircraft's daily activities – in detail. When a single aircraft is being flown by many pilots, it's self-evident that it's important to know who did what, when.

But it also makes sense for Part 91 pilots to keep a flight record up-to-date.

Many examiners have noted that daily flight records are generally well-maintained during ab initio training, but they often 'slip' once a pilot starts to get a few hours under their belt. Pilots, regardless of their experience or training status have an obligation to keep accurate records. This obligation extends to the aircraft operator as well.

Among the many excellent reasons an operator and pilot should keep a current daily flight record:

- » It's a record of the duration of flights, which helps to indicate when the plane is due for its next maintenance check. It's important to note that the daily flight record isn't the same as the technical log. The tech log documents time in service, whereas the daily flight record documents flight time and must be kept by the operator for 12 months after the flight. The tech log does not meet the requirements of a daily flight record.
- » It also feeds information into the pilot logbook, necessary for the assurance of the Director of Civil Aviation regarding a pilot's competency and currency.
- » In a sector obsessed with 'hours', it keeps track of how many hours a pilot is accumulating, and allows them to verify an entry in their logbook.
- » It assists the filling out of CAA quarterly returns for the aircraft.
- » It's evidence of where a pilot was at a particular time, putting to rest arguments over a landing invoice for instance, or people on the ground complaining of a 'nuisance' aircraft.
- » It's the sole legal source where such details are collectively recorded.


Daily flight records are required under Parts 91, 115, and 135. Beyond compliance, it's also helpful to both pilot and operator to have one filled out after each flight.



// Nelson Aviation College C-cat instructor Breanna Coffey and CPL student Rachel Mackie fill out the daily flight record for ZK-NAX.

For the record (no pun intended), under rule 91.112(a), a daily flight record must contain the following:

- (1) the name of the operator
- (2) the name of the pilot-in-command
- (3) the names of other crew members
- (4) the registration markings of the aircraft
- (5) the date of the flight
- (6) the purpose of the flight
- (7) the time of commencement of the flight
- (8) the name of the departure aerodrome
- (9) the flight time.

If you're a Part 115 participant, check your obligations under rule 115.455. If you're a Part 135 participant, check them under rule 135.857. 

# TIPS FROM THE NEWBIES



New pilots will often identify issues no longer obvious to more experienced aviators. Here are some tips from the Young Eagles who attended the Flying NZ national championships at North Shore in February 2019.

**T**hey have only a few hours flying experience but they bring fresh eyes to an activity where experience doesn't always equal safety.

Ten of the 2019 muster of Young Eagles were at North Shore in February for Flying NZ's national championships. It's a mark of the calibre of this relatively inexperienced group, that some of them beat their higher-hours peers in competitions.

Joseph Allen-Perkins flies at South Canterbury Aero Club. The 18-year old is a 2019 Ross Macpherson Memorial Scholarship winner\* and he's accumulated about 50 hours towards his PPL.

"Probably my biggest thing at the moment is building situational awareness. One of the ways I'm trying to do that is really focussing on listening to radio calls while I'm on the ground. As soon as I hear the calls coming in, I start to build a mental picture of where all those aircraft are. »

// From left: Blair Stevenson, Lucy Laby, Gemma Douglas, Adam Hancock, Ben Alexander, Joseph Perkins-Allan, Sam Inskeep, Holly Lyttle, Scott Wright, Heidi Vogel. Photo courtesy of Andrew Lindsay.

\* Five or six Ross Macpherson Memorial Scholarships are awarded to Young Eagles each year for flying lessons, underwritten by the CAA, Airways, Avsure and Aspeq.

“When I was at about the 10-15 hour level, I couldn’t do that very well, so it feels great I’m now able to build that skill.

“Even if people are chatting around me, or even to me about something unrelated, I will make sure I’m paying attention to what I’m hearing on the radio.”

Fellow South Canterbury pilot is Lucy Laby – also a 2019 Macpherson scholar. She was runner up in the Jean Batten Memorial Trophy at the championships, open to all student pilots.

As the 17-year old approaches 50 hours, she’s aware she’s entering the so-called ‘death zone’ of 50-350 hours when pilots can feel invincible but lack experience.

“I hope I always feel like I do now – that there is so much to learn,” says Lucy.

“I think things can get dangerous when you feel like you know it all. Even if you get to a point where you already know a lot of what you’re hearing about, there’s always a skill you can learn about or improve on.”

Seventeen-year old Blair Stevenson was overall winner of the 2018 Macpherson scholarship. At the 2019 national champs he was runner-up in the Aero Engine Services competition for basic aerobatics, and third in the junior landing competition of the Wigram Challenge Cup.

Blair emphasises the importance of always getting a complete weather forecast before flying.

“The weather in New Zealand can quickly change from a nice blue sky day to having a front come through without much warning.

“Running into bad weather can quickly upset a good day’s flying,” he says, with understatement.



// At the national champs, the CAA’s Paula Moore gave the Young Eagles a lesson on reading VNCs.

Seventeen-year old Scott Wright is another South Cantabrian pilot and won a Macpherson scholarship in 2018.

He knows from personal experience why a thorough preflight is important.

“I’ve found birds’ nests inside the rudder.”

Scott also prepares for radio comms before he leaves.

“I make sure I know all the radio frequencies I’m going to need. For instance, if I’m doing a cross-country between Timaru and Christchurch, I’m going to be on Timaru, Uncontrolled, Christchurch ATIS, Christchurch Approach, Tower and Ground. That’s a lot of frequency changing and I don’t want to be wondering what I should be on, and where, when I’m concentrating on flying as well.”



// Lucy Laby, from South Canterbury Aero Club, competes in the preflight competition.

Sam Inskeep, from Tauranga, is the 2019 winner of the Kirk Samuel Dakers Memorial Scholarship, sponsored by Nelson Aviation College in memory of one of its instructors.

As he works towards his PPL, the 16-year old keeps the aviation mantra, 'aviation is unforgiving of mistakes', in the forefront of his flying practice.

"It constantly reminds me to regard all aspects of aviation safety as crucial. It simply but vividly shows what could happen if I fail to comply with safety standards."

North Shore Young Eagle Gemma Douglas is also a 2019 Macpherson scholar. The 16-year old is preparing for her first solo, and says one of the things she enjoys most is doing a thorough preflight.

"Someone told me once I should 'take care' of the aircraft, as you would a human. So I treat it almost as if it has a personality. For instance when I do my preflight I always drag my hand across the wings to make sure it has no 'bumps and bruises' – dents and scratches and stuff.

"If it's 'happy' before I fly, it'll treat me well."

// I think, as student pilots, it's our responsibility to make sure we're comfortable with what we've learned, or if we need to put in more time. //

Adam Hancock was part of the Mid Canterbury Aero Club team that triumphed at the national championships. The club team took out both the North Shore Trophy for the club with the most overall points at Nationals, and the prestigious Wigram Challenge Cup for the club team challenge. Adam also won the junior landing event in the Wigram competition.

The 17-year old agrees with Joseph Perkins-Allan about the importance of situational awareness.

"Even if you've carried out every other safety measure, with poor situational awareness, nothing else will matter.

"I practise building situational awareness, not just in the air, but on the ground. I take conscious, deliberate note of what's around me, for instance, as I'm walking through the aerodrome.

"Using my eyes is number one for me."

Eighteen-year old South Cantabrian Holly Lyttle is working towards her CPL. She is the winner of the 2019 Waypoints Aviation Scholarship; and at the championships, of the Newman Cup for precision circuits, open to pilots up to CPL level.

One of the tips Holly has received during her training is that the flight begins the night before departure.

"I think about the choices I make during that evening and the possible impact they'll have on my ability to fly well and safely the next day.

"When I wake up the day of the flight, I think about how much sleep I've had and assess how I'm feeling. I also have a good breakfast, and then make a final decision on whether it's safe for me to fly."

A member of Marlborough Aero Club, 17-year old Ben Alexander is a 2019 Macpherson scholar and aims to get his PPL before he leaves school at the end of the year.

With about 30 hours under his belt, Ben says one of his most important safety tips is using common sense in weather decision-making.

"If I'm second-guessing myself about what I'm flying into, I'll turn back. It's only me who can be honest about whether I'm putting myself and any passengers I carry in the future, at risk."

Heidi Vogel is the overall winner of the 2019 Macpherson scholarship, and at the championships she won the Nola Pickard Memorial Trophy for a series of aviation tests for the Young Eagles.

Flying at South Canterbury, the 16-year old says number one for her is to simply listen – and ask.

"Everyone at the aero club has their own experience and advice to share. I think it's important to be able to adapt to advice, and keep an open mind about flying.

"Also, not to be embarrassed about asking for more practice, or clarification on theory. In aviation, there's no 'fake it till you make it'. Like any skill, people learn at different speeds, and I think, as student pilots, it's our responsibility to make sure we're comfortable with what we've learned, or if we need to put in more time.

"The more comfortable we are in the aircraft, the more likely we will be to quickly recognise potential risks and problems, and to be able to act swiftly and appropriately." ✈

I learned about flying from that //

# STRAYING FROM STANDARDS



It might seem like rigidly sticking to best practice is a pain, when workarounds and shortcuts seem to do as good a job. This pilot's story illustrates how getting even a *little* casual with safety standards could end in disaster.

// Above: this 'dart' stops the beehives spinning during flight.



**T**he task was to fly beehives to new honey areas. We do this every year, on and off over the summer months, while the flowers are out.

The first flight of the day was taking two beekeepers from the load site to the drop site, so they could unhook the hives after I flew them there, and prep them for the honey season.

After giving a safety briefing to our two passengers, I walked back to the aircraft where the ground crewman had carefully laid out for my inspection, the 20 ft lifting line with a beehive ‘dart’ attached to the end of it. This weather vane-type device prevents the beehives spinning during flight.

I walked along the line, having a look at its condition, and confirming the crewman had the D-shackle laid on the ground and not attached to the aircraft cargo hook. I wasn’t lifting beehives on this first trip.

The helicopter was ready, the dart and lifting line had been inspected, and the line wasn’t attached to the aircraft. So far so good. I climbed into the helicopter, got seated, and belted myself in. The crewman boarded the passengers, assisted them with their seatbelts, and closed their door.

We lifted off, gained height, and I put on a little forward speed to get going. Immediately, I felt a very slight jolt through the airframe and I knew straight away the 15 kilogram dart was being jerked off the ground.

I instantly realised that somewhere in the moments when I was boarding and preparing myself for the flight, the crewman must have reached underneath and quickly hooked the strop, with the dart on the end, to the helicopter.

I didn’t want the dart snagging on anything and bringing us down, so my first reaction was to slow the aircraft to lose that forward momentum.

I pulled the cyclic back, and looked out and down – the door had been removed for lifting – to get a visual on the dart. There it was, at the end of the lifting line, benignly resting next to a wire farm fence.

What I didn’t realise was that, between the dart being snatched from the ground and ending up against that farm fence, it had smashed through a very old brittle wooden farm gate and destroyed it – which clearly also carried the potential to bring us to the ground.

We didn’t feel the ‘collision’ because of the opposing forces of the slowing helicopter and the forward propulsion of the line and dart into the gate. Had we all been travelling at the same speed we would have been aware of the impact.



// Beehives are regularly lifted by helicopters, taking them to new patches of Manuka.

Because my immediate focus was on the dart, I didn’t even notice the destroyed gate beside where it rested. I simply released the line, visually confirmed the release, and carried on to the destination to drop our passengers off.

I called my ground guy on the radio.

“You hooked up the line, man. I didn’t ask you to do that! That was so lucky!”

And he said, “Yeah – that was lucky!”

The thing was, I was referring to our luck that we didn’t take the dart through the fence.

And he was referring to the luck that we didn’t get hooked up on the gate he’d just seen get destroyed. »

**// Immediately,  
I felt a very slight  
jolt through the  
airframe and I knew  
straight away the  
15 kilogram dart  
was being jerked  
off the ground. //**



// The replacement gate, and the remnants of the original.

I talked to the ground crewman about better communication because he hadn't told me he was attaching the line to the helicopter before that initial flight. Apart from that, I thought nothing more about the whole incident.

### The awakening

A couple of days later one of the beekeepers texted me a photo of the smashed gate. He messaged, 'the farmer says you smashed his gate'.

And I was, like, "no way! I didn't smash his gate. That looks like a car or bull has smashed through. If I'd smashed his gate, I'd have known about it."

So I rang my ground guy, and each of us was utterly disbelieving.

I said, "Hey bro, they're saying I smashed the gate," and he replied, "yeah, straight through the gate with the dart bro - remember?"

And I said, "Nah, no way! I didn't know I'd smashed the gate!"

"No way!" he replied, incredulous. "That dart went right through the gate man, I saw it happen!"

"Why didn't you say something?"

"I thought you knew!"

I apologised to the farmer, gave him a box of beers for the hassle, and we replaced the gate.

By now it was evident this was a pretty substantial incident, and, as per our system, we investigated it in-house and submitted a 005 report to the CAA.

Some might look at the ground man's actions as the sole cause. Out of sheer habit and in a momentary lapse of concentration, he'd hooked the line to the chopper when he didn't need to - and didn't tell me he'd done it.

But it wasn't a one-off human error that had caused the problem. We'd been allowing an unexamined drift from what our standard operating procedures said we'd do. We'd become comfortable with a workaround that we thought was safe, but we hadn't looked at it closely enough.

Because right up until the moment that dart went through the gate, it all *did* seem safe.

### This is how it happened

To unhook the beehives from under the hovering helicopter, the beekeepers must wear safety helmets, one of them enabled with built-in aviation communications. Due to the complexity of putting together or obtaining such a comms helmet we'd agreed we would supply one of ours to one of them.

That meant we were one helmet down and it was company policy that in such circumstances, a spare had to be taken to all in-field jobs. That's because, before the first beehive lift of the day, the ground guy hooked the lifting line to the helicopter while it hovered over him and he needed to be helmeted to do that. I didn't want a D-shackle, inadvertently released, hitting his unprotected head.

// Had that dart  
snagged on  
something solid like  
the gate strainer  
post, we were so  
low we would have  
been dead in a  
second. //

But in the recent past the ground guy had occasionally forgotten to bring the spare from the hangar. So we'd devised a workaround to ensure safety. We'd temporarily changed our SOP so that, rather than the aircraft hovering over him, he'd connect the line only when it was on the ground. He'd stand outside the helicopter facing me inside the cockpit; he'd hook up the line, and I could see that happen.

This had worked so well over the past few days that not bringing the helmet and using the temporary workaround had, in fact, become our new normal.

It was just a verbal agreement between us that this is what we would do to get by without the helmet, and we never stopped to weigh any risk associated with doing that. I basically just said, “can you hook it up only when it’s landed on the ground?”

This informal approach to procedure perhaps led my ground crew to, on this one occasion, also not stick to our verbally agreed practice, and suddenly hook up the line when it wasn’t needed. And not ensure I knew that.

A stauncher sticking to procedure would have meant no miscommunication about what each of us should do; no assumptions that each of us knew what the other was doing; and no new work habit that we’d rushed in to make right the fact we were no longer sticking absolutely to our SOPs.

It was a classic Swiss cheese accident looking to happen. The final line of defence preventing all the holes lining up was sheer luck. Had that dart snagged on something solid like the gate strainer post, we were so low we would have been dead in a second.

But sheer luck is no legitimate line of defence.

## Lessons learned

So what have we learned? Well, when I give those initial briefings to passengers, I invite all on site to stop and join in, so everyone is hearing the same story, questions are asked, and job steps are clarified.

Next season, while we will again loan one of the beekeepers a comms-enabled helmet, we’ll never leave the spare back in the hangar. Without the spare, the job won’t proceed.

If we ever have to modify something again out in the field, we will pause and take stock of what we’re proposing, looking for where it could create new dangers.

What happened to us was not the result of a reckless decision. It was just human nature and we tried to do the right thing to mitigate any risk.

What we didn’t do was reflect enough on the possible effect of an on-the-spot change to our standard operating procedures.

And it could have killed three people. 🚨

## Swiss cheese model of accident causation

In Professor James Reason’s Swiss cheese model of accident causation, an organisation’s defences against failure are represented as slices of cheese. The holes in the cheese represent weaknesses in the system. When those weaknesses line up, a hazard passes through the holes, leading to an accident.

The CAA database is peppered with numerous incidents where it was good luck and not good management, that the outcome wasn’t catastrophic.

### Lack of rigour around safety procedures

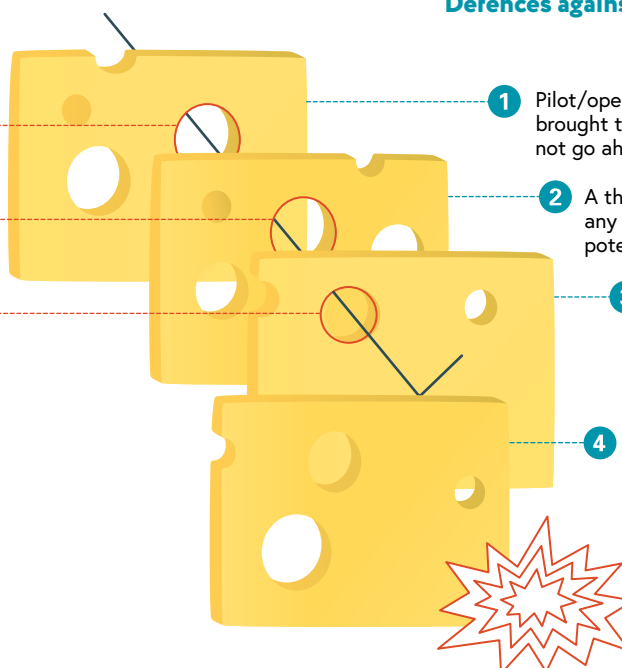
Ground crewman forgets helmet – this becomes acceptable to pilot/operator

Lack of reflection as to the ‘nuts n bolts’ of new temporary SOP

No communication from ground crew that he’s hooked up line

### Defences against accident

- 1 Pilot/operator insisting helmet is brought to in-field job – task does not go ahead without it
- 2 A thorough examination of any temporary SOPs and any potential ‘hooks’ it may contain
- 3 A shared understanding as to what information would be exchanged at each step of SOP
- 4 Sheer luck



Potential triple fatality



# WHO ‘DOES’ SMS AT YOUR PLACE?

The safety manager may be the initial go-to of a safety management system, but everyone needs to be responsible for its success.



“**T**o be honest, it was a bit overwhelming.” That was Alex Turnbull’s first reaction when he began coming to terms with safety management systems.

Alex is one of six pilots at Air Milford, and the company’s safety manager.

Fortunately his sense that there was just too much to establishing an SMS didn’t last long.

“After studying the ‘how to do an SMS’ stuff for a while, I realised we were doing most of it already.”

Although Air Milford is an SMS Group One operation, it’s more like a Group Two organisation in size. Specialising in scenic trips around the Milford and Queenstown regions, the Part 125 organisation has 12 employees and five aircraft.

“Being smaller, and already having a robust QA system in place, definitely made the move to SMS easier,” says Alex.

Initially it was Alex who was tasked with drafting what he thought was needed.

“I took that to management, and importantly, could show them from a practical point of view, how straightforward I believed the transition to SMS would be.

“Up until then, it would be fair to say, they didn’t relish the idea of SMS, but once they realised it was basically what we were doing already, they bought into it.”

British SMS specialist Neil Richardson says the development of a safety management system must begin at the top.

“Management needs to lead the way, to ‘show willing’ so a genuine safety culture develops – that means across the entire organisation and includes external stakeholders.

“If the safety manager is the only one advocating the safety message and trying to make decisions, then it is less likely to succeed.”

With management and senior staff on board, Alex then brought in the wider staff.

“It was important that I could reassure them that SMS wasn’t going to be that unfamiliar to them.

“Because we’re such a small operation, everyone has multiple roles – the accountant can sometimes be out on the apron loading and unloading planes – so everyone could have input into what our SMS would ultimately look like.”

In some ways, Alex says, SMS is almost not on Air Milford’s conscious radar.

“It’s so much a part of our day-to-day activity, we don’t always think about it explicitly. It’s not something that’s special or put on top of what we do ‘for safety.’”

Neil Richardson says the role of safety manager should be that of trusted advisor, not sole operational decision-maker.

“It’s senior leaders who need to satisfy themselves that ‘risk owners’ are making sound decisions about lowering that risk to as low as reasonably practicable.

“And other staff, who sometimes know what the real issues are, or who are best placed to help, should also have a place at the SMS table.

“It’s not always just the safety manager and leadership with the bright ideas.”

Alex says the biggest difference between the previous QA system and SMS is that safety decisions are discussed, communicated and documented in a more structured way.

“Although even a very minor incident would never go unexamined, we wouldn’t always formally document how we were going to stop it happening again.

“Now, that’s written down so everyone has access to it.”

Alex has also devised an ‘operations notice system’ – a board for written messages and the initials of each pilot, accompanied by a coloured tag.

“When I, or the chief pilot, issue a new message, the tags next to each pilot’s initials are turned to red. That way, the pilots know there’s a new message they must read.

“When they’ve read it, they sign the board and turn their tag over to green, and I can see the message has been read.”

Alex has also made more use of internal emails.

“I know there’s a bit of pushback these days about email messages. But if you use them sparingly and only for really important messages, they’re a good way of getting a message out while you think of it and are maybe short of time; and unlike a paper note, they can’t get lost.”

An added advantage with email messages, of course, is that the sender can also set up an auto-confirmation message, so they know the recipient has received the email.

## // It’s not always just the safety manager and leadership with the bright ideas. //

Alex is also improving the way staff can report concerns.

“If you give someone a pen and paper and ask them to write it down, they groan. If they can do it electronically they’re much more likely to comply.”

Alex is therefore working on a fillable electronic document to make it quicker and easier to report.

“SMS encourages you to look at the procedures in your manuals from a practical viewpoint and question, ‘in reality, does this actually work for us?’ Our reporting system was a good example of that.”

Alex also says SMS is never going to be perfection. “You’ve got to keep examining what you’ve put in place and ask, ‘does that still work for us?’”

That’s why Alex chose not to use an outside consultant to draw up an SMS plan for Air Milford.

“I needed someone with an intimate knowledge of how the operation works,” he says.

Air Milford has various kinds of safety meetings.

“We have formal, dedicated, documented safety meetings, with minutes. We have casual, almost spontaneous ‘cup of tea’ meetings, particularly with the pilots. Sometimes we start out like that but actually they become more formal because a good decision is reached and that decision needs to be documented.”

Alex tries to call formal safety meetings when most staff are present.

“It’s not always easy. We’re a seven-day operation and there’s always someone having a day off.

“But I bribe them with a good cup of coffee to come in for just an hour, to take part. That seems to work well,” he laughs. ➤

# SERVICE BULLETINS AND YOU

If you're an aircraft owner or operator, you ignore service information at your peril.

Service bulletins are produced by aircraft manufacturers to communicate continuing airworthiness information to the owners and operators of their aircraft.

They can also be published by vendors who supply aircraft manufacturers, and by product original equipment manufacturers (OEMs).

Generally, three types of information are contained in them:

- recommended methods, techniques, and practices for the performance of maintenance
- recommended modifications or inspections
- mandatory actions established as part of the type certification process.

They're usually generated as a result of defect reports received by the manufacturer or the regulator of the state of design.

## The rule

Rule 91.603(a)(1) requires operators to ensure their aircraft are maintained in an airworthy condition. To do this, operators should have access to all available instructions for continued airworthiness, including service information. This is to assess whether the information applies to their operation, and to take the appropriate action. This review should be carried out by a knowledgeable person, and the outcome of the review recorded and signed by the aircraft operator in the appropriate maintenance logbook.

If you elect not to carry out a service bulletin, you should have a valid reason for it, and the reason recorded. This improves transparency and helps subsequent operators or engineers later down the line understand why a particular decision was made.

Part 119 operators, and those with a maintenance programme approved under rule 91.607, should have a documented process for conducting and recording the evaluation of service bulletins.

## Complying with service bulletins

You should comply with service bulletins if:

- they're referred to in the schedule that recommends the incorporation of modifications or the performance of inspections
- your aircraft is maintained in accordance with the manufacturer's maintenance schedule
- your exposition states that mandatory service bulletins shall be complied with.

Occasionally manufacturers issue service bulletins to communicate airworthiness limitations such as component life limits or maintenance requirements.

When used in this way, the content of the bulletin is a condition of type certificate, and compliance is mandatory.

A service bulletin can, in time, become an airworthiness directive (AD) if a serious safety concern becomes evident. It's often cheaper and easier to carry out an inspection or modification while it's a service bulletin, rather than waiting until it becomes an AD. By that time, parts can be harder to obtain and free replacement offers made by manufacturers may have expired.

## More information

- Continuing airworthiness notice – 05-002 *Service Bulletin Compliance*. This provides guidance to aircraft operators and maintenance engineers regarding the assessment of, and their decision as to whether they need to comply with, manufacturer's service information. This is available on [www.caa.govt.nz](http://www.caa.govt.nz), "Quick Links > Airworthiness Directives > Continuing Airworthiness Notices".
- Subscribe to 'Airworthiness directives' and 'Airworthiness issues' notifications by visiting [www.caa.govt.nz/subscribe](http://www.caa.govt.nz/subscribe). It's important to subscribe to both lists as the first only provides alerts for ADs, while the latter provides alerts for other advisory information.
- Ensure you go directly to your manufacturers and suppliers to subscribe to updates, to cover all your bases. ➔

# SPARKING KNOWLEDGE OF FUEL CHEMISTRY

A paddock landing has highlighted the dangers of spark plug fouling.

In 2018, a Cessna 152 suffered partial power loss, which led to a (safe) paddock landing. While the probable cause of the power loss was carb icing, further investigation found that two rear lower spark plugs were excessively lead fouled. These could have exacerbated the power loss.

Spark plug fouling is associated with the complex chemistry of Avgas fuel. The scavenging additive in the fuel requires high temperatures to convert the tetraethyl lead (TEL) within the fuel to a gas, which can be exhausted overboard.

Vaporisation of the TEL may not be complete when the following conditions exist:

- engine temperatures reduce as a consequence of carb icing
- a low-powered descent
- a rich mixture.

When this occurs, lead deposits can form in the spark plug electrodes. This causes the spark plugs to foul and misfire.

## Practical tips

It's critical to establish and maintain appropriate engine operating temperatures to ensure the TEL is properly vaporised and exhausted overboard.

CAA Principal Aviation Examiner David Harrison says "there's plenty of guidance on the handling of carb icing and the correct procedures for engine leaning. You can find this in theory syllabuses, practical teaching through flight training, and in aircraft flight manuals.

"However, if you're ever unsure, seek the advice of an instructor – there's no such thing as a dumb question in aviation."

Shell's website also offers interesting background information about preventing lead fouling and other details about spark plugs.

Visit [www.shell.com](http://www.shell.com), "Business customers > Aviation > AeroShell Aviation Lubricants > Aeroshell Knowledge Centre > Technical talk".

## More information

- The defect report relating to the 2018 incident, 18/6705, can be read in "GA defects" on page 27.
- Refer to the CAA's *Aircraft Icing Handbook* for more information on carburettor icing. Visit [www.caa.govt.nz](http://www.caa.govt.nz), "Safety Info > Publications".
- Australia's Civil Aviation Safety Authority (CASA) has a helpful carburettor icing probability chart. This can be found through an internet search. ➔

## SECTOR RISK PROFILE UPDATE

Sector risk profiles assist an aviation operator to identify potential risks and their severity. The operator can then decide which risks apply to their business, and mitigate them.

The profiles are dynamic, and are reviewed and updated. To this end, there were workshops in March 2019 to discuss and refine two SRPs:

- Part 121, 125, 129, and ANZA Medium and Large Aircraft Air Transport SRP, developed in 2017

- Part 135 Helicopter and Small Aeroplane Operations SRP, developed in 2018.

The workshops reviewed five of the risks for each sector. Participants shared controls they were using to manage and mitigate risks, and any barriers to safety improvements they had identified. The other risks still need to be considered.

The SRP reports have been updated as a result of the workshops, visit [www.caa.govt.nz/srp](http://www.caa.govt.nz/srp).

The SRP reports are valuable resources assisting aviation operators to comply with:

- Civil Aviation Act 1990
- SMS requirements
- Health and Safety at Work Act 2015.

The CAA will also use the SRPs to apply resources to areas contributing to safety risk. ➔

# NEW AND UPDATED PRODUCTS

The CAA's safety promotion team has been busy creating new titles, and updating existing ones, in the Good Aviation Practice (GAP) booklet range.

## ////// New titles



### **Becoming a licensed aircraft maintenance engineer**

For anyone thinking of taking up a career that's varied, highly skilled, and absolutely critical to aviation safety, this booklet gives the nuts and bolts of how to get started.



### **How to be a pilot – junior**

This booklet introduces 8-12 year olds to what is involved in becoming a pilot; and to a possible career in aviation.



### **How to be a senior person**

Organisation certificate holders are required to have people designated as senior persons with specific responsibilities. This booklet prepares would-be senior persons for what will be required of them.



### **How to be an aircraft owner**

Owning their own aircraft is a dream for many pilots. But owning an aircraft carries many responsibilities and obligations. This booklet describes what those are, for each category of aircraft.

## ////// Recent revisions



### **VFR Met**

A comprehensive Met briefing is one of the most important tools in your planning and decision-making kit. This booklet describes the sources of Met information, building the picture, available Met products, and what you should do before and during flight.



### **How to navigate the rules**

Whether aviation is your business or pleasure, you must follow the Civil Aviation Rules, established by the Minister of Transport in the public interest. This booklet explains the process of rule-making, and gives you an idea of the ones applying to your aviation activity.



### **How to be a pilot**

Whether you want to be a weekend flyer, or a Boeing 737 captain, initially you'll follow much the same process. This booklet explains how, during training, you'll learn about yourself, the aircraft, weather, flying environment, and the rules pilots use to keep their flying safe.

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These, and our other GAP booklets, are available on the CAA website, [www.caa.govt.nz](http://www.caa.govt.nz), "**Quick Links > Publications > Good Aviation Practice booklets**".

Or you can order free printed copies by emailing [info@caa.govt.nz](mailto:info@caa.govt.nz).

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## // FLIGHT INSTRUCTOR SEMINAR 2019

The CAA flight instructor seminars are held every two years, and are an excellent opportunity for flight instructors to network and develop professionally.

The seminars aim to raise awareness of a number of topical issues, and the CAA encourages all flight instructors (including microlight, glider, etc) to attend. This year the theme is "Supervision, Mentoring and the Flight Instructor".

For more information as it becomes available, visit [www.caa.govt.nz](http://www.caa.govt.nz), "Quick Links > Seminars and Courses". You can also subscribe to the "Flight Instructors" email notifications, [www.caa.govt.nz/subscribe](http://www.caa.govt.nz/subscribe).

### DATES AND VENUES FOR 2019

#### Masterton

6–7 August  
Cophthorne Solway Park

#### Ashburton

13–14 August  
Hotel Ashburton

#### Hamilton

20–21 August  
Distinction Hotel

## HOW TO GET AVIATION PUBLICATIONS

### AIP New Zealand

AIP New Zealand is available free from [www.aip.net.nz](http://www.aip.net.nz). Printed copies of Vols 1 to 4 and all aeronautical charts can be purchased from Aeropath on 0800 500 045, or [shop.aeropath.aero](http://shop.aeropath.aero).

### 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](mailto:aero@caa.govt.nz).

To allow for processing, the CAA needs to be notified **at least one week** before the Aeropath 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/](http://www.caa.govt.nz/general-aviation/aviation-events/).

CAA cut-off date	Aeropath cut-off date	Effective date
05 June 2019	12 Jun 2019	15 Aug 2019
03 July 2019	10 Jul 2019	12 Sep 2019
31 July 2019	07 Aug 2019	10 Oct 2019
28 Aug 2019	04 Sep 2019	07 Nov 2019

See [www.caa.govt.nz/aip](http://www.caa.govt.nz/aip) to view the AIP cut-off dates for 2019.

## 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](mailto:don.waters@caa.govt.nz)

**John Keyzer** – Maintenance, North Island  
027 213 0507 / [john.keyzer@caa.govt.nz](mailto:john.keyzer@caa.govt.nz)

**Carlton Campbell** – South Island  
027 242 9673 / [carlton.campbell@caa.govt.nz](mailto:carlton.campbell@caa.govt.nz)

**Neil Comyns** – Maintenance, South Island  
027 285 2022 / [neil.comyns@caa.govt.nz](mailto:neil.comyns@caa.govt.nz)

## REPORT SAFETY AND SECURITY CONCERNS

Available office hours (voicemail after hours)

**0508 4 SAFETY** (0508 472 338)

[isi@caa.govt.nz](mailto: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](http://www.caa.govt.nz/report)

The Civil Aviation Act 1990 requires notification "as soon as practicable".

# ACCIDENT BRIEFS

## Hughes 369E

Date and time:	19-Feb-2017 at 09:45
Location:	Ohakune
POB:	1
Injuries :	1 serious
Damage:	Destroyed
Nature of flight:	Other aerial work
Pilot licence:	Commercial pilot licence (H)
Age:	29 yrs
Flying hours (total):	1094
Flying hours (on type):	803
Last 90 days:	53

The helicopter was conducting external load operations moving beehives. For this operation, two company helicopters were engaged, with both pilots electing to use a 'bee-wing', attached to the belly hook of the aircraft with a short 10 m cable, to lift the pallets of beehives.

At approximately 0920 hours NZDT, the aircraft was on a return flight from the drop-off location when the cable, weighted only with the bee-wing, came into contact with the tail rotor. This resulted in the cable wrapping around the tail rotor hub and gearbox, causing the tail rotor assembly and cable with the bee-wing attached, to depart from the aircraft.

The aircraft yawed to the right and the pilot was unable to maintain directional control. After several rotations, the aircraft struck the side of a ridge, rolled approximately 35 m down the slope and came to rest on its right side. The pilot, who was the sole occupant of the helicopter, sustained significant injuries and was subsequently airlifted to hospital.

The safety investigation was unable to determine conclusively why the cable contacted the tail rotor. It is most likely that the short strop, low mass configuration increased the risk of contact with the tail, particularly when combined with an airspeed at which the load may have become unstable.

CAA Occurrence Ref 17/631

For a similar occurrence, see the article on page 16.

More accident briefs can be seen on the CAA website, [www.caa.govt.nz](http://www.caa.govt.nz), "Accidents and Incidents".

Some accidents are investigated by the Transport Accident Investigation Commission, [www.taic.org.nz](http://www.taic.org.nz).

## Schleicher ASH 31 Mi

Date and time:	06-Feb-2016 at 15:40
Location:	Ben Ohau Range
POB:	1
Injuries	1 fatal
Damage:	Destroyed
Nature of flight:	Private other
Pilot licence:	Gliding New Zealand Qualified Pilot Certificate (QGP)
Age:	55 yrs
Flying hours (total):	289
Flying hours (on type):	92
Last 90 days:	89

CAA's investigation found the accident occurred as a result of the glider striking the side of a ridgeline while attempting to gain altitude in close proximity to mountainous terrain. The pilot was able to vacate the wreckage and then move some distance from the glider, before succumbing to injuries received in the accident.

There was a delay in locating the glider because the pilot did not activate their personal locator beacon; there was no flight following information; and the pilot's intended route was unknown.

The pilot was operating within the civil aviation rule requirements and within the guidelines of the gliding club, of which the pilot was a member. No CAA safety recommendations were raised as a result of this accident.

A safety action was carried out by Gliding New Zealand by amending their advisory circular AC2-13 *Mountain and Ridge Soaring Safety Principles*, providing glider pilots with advice on flight following procedures.

The full report is on the CAA website.

CAA Occurrence Ref 16/437



// An example of a fouled spark plug, also from a Cessna 152. See GA defect next page >>

# GA DEFECTS

## KEY TO ABBREVIATIONS:

**AD** = airworthiness directive    **NDT** = non-destructive testing  
**TIS** = time in service                **TSI** = time since installation

**P/N** = part number                    **SB** = service bulletin  
**TSO** = time since overhaul        **TTIS** = total time in service

Cessna 152	
Spark Plugs	
Part manufacturer:	Tempest
Part number:	UREM37BY
ATA chapter:	7420
TSI hours:	51.5
TTIS hours:	2846.3

A student pilot executed a precautionary landing after their aircraft's engine suffered partial power loss. The aircraft landed without incident or damage in a paddock.

During descent the student alerted another aircraft and ATS. After landing, the student contacted a passing commercial aircraft who relayed the message that the aircraft and pilot were safe. RCCNZ dispatched a rescue helicopter which collected the student and confirmed they were uninjured.

A subsequent run-up could not fault the engine, however the investigation revealed two rear lower spark plugs were fouled. The aircraft was flown out of the site by the CFI without incident.

It couldn't be determined whether the initial power loss was as a result of carb icing, or spark plug fouling, or a combination of both. However, the sequence of events suggests that carb icing may have been the first adverse impact on engine performance.

Spark plug fouling is associated with the complex chemistry of Avgas fuel. The scavenging additive in the fuel requires high temperatures to convert the tetraethyl lead (TEL) within the fuel to a gas, which can be exhausted overboard. When engine temperatures reduce as a consequence of carb icing, with a low-powered descent, and when running a rich mixture, the complete vaporisation of the TEL is prevented. When this occurs, lead deposits can form in the spark plug electrodes.

Safety recommendations:

1. Flight training schools should consider supplementing existing information relating to carb icing and plug fouling with information provided by engine manufacturers, and fuel manufacturers.
2. Use of CASA's *Carburettor icing probability* chart can assist with preflight planning and inflight engine management.

CAA safety investigation note: The pilot's early decision to find a suitable place to land resulted in a safe outcome. The pilot's actions in quickly alerting other traffic and ATS meant that rescue services were alerted and dispatched quickly to assist the pilot. These are valuable lessons to other pilots.

[CAA Occurrence Ref 18/6705](#)

[See the article on page 23 for more information.](#)

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](http://www.caa.govt.nz), "Accidents and Incidents".

NZ Aerospace FU24-950	
Centrifugal Compressor Wheel	
Part model	M601D-11NZ
Part manufacturer:	Walter
ATA chapter:	7230
TSI hours:	77.8
TSO hours	339.3
TTIS hours:	5314.3

Ten seconds after take-off, the pilot heard a strange noise and noticed smoke coming from the exhaust. Engine performance started decreasing and the inter-turbine temperature started to increase.

The pilot jettisoned the load and performed an emergency landing. A humming noise was heard until the engine was shut down. The engine idled normally and was shut down after about 30 seconds, with heat and speed at normal. The pilot reported the engine was running normally, and well, before the event.

The engine was removed and returned to GE Aviation for repair. This was the second occurrence of this nature on this engine since previous repair 180 hours prior.

The investigation by GE Aviation concluded the root cause was most likely a combination of the following factors:

1. Specific M601D-11NZ combination of M601D engine parts, M601E engine compressor, and CNC machined impeller, and operating cruise RPM speed 92 percent NG (for this aircraft and operator mission) close to identified high responding mode of impeller vanes.
2. The working theory is that residual stress in the area of the machining step could affect the integrity of the vane. There is therefore a potential effect on the opposite side of the vane where the crack origin was found.

The investigation determined no fleet actions are required. The ongoing corrective action is to tune the compressor rotor speed outside the marginal HCF response within the engine specification.

[CAA Occurrence Ref 18/2195](#)

# AVIATION SAFETY OFFICER COURSE

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

If your organisation operates commuter services, scenic operations, agricultural operations, flight training, sport aviation, or engineering, you should have an aviation safety officer.

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

You will receive comprehensive guidance material and access to all the latest CAA safety resources and support.

**Tauranga 04–05 July 2019**

The Tauranga on the Waterfront

**Hamilton 26–27 September 2019**

Novotel Hamilton Tainui

**Christchurch 31 October–01 November 2019**

Sudima Christchurch Airport



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Many owners and operators want to increase their understanding of the requirements for maintaining their aircraft.

The Airworthiness and Maintenance Workshop is designed for a wide range of aviation participants, from airline maintenance planners to private aircraft owners.

The two-day workshop takes a practical approach. There is a limit of 18 participants for each workshop to allow for interaction.

**Tauranga 02–03 July 2019**

The Tauranga on the Waterfront

**Palmerston North 20–21 August 2019**

Hotel Coachman

**Hamilton 24–25 September 2019**

Novotel Hamilton Tainui

Check the CAA website [www.caa.govt.nz](http://www.caa.govt.nz), "Quick Links > Seminars and Courses" for more information and to enrol online. Places are limited and they fill up quickly, so enrol early.

Accommodation and travel costs are your responsibility, but morning tea, lunch and afternoon tea are provided.