

vector



GoPro® Safety

Personal Preflight

Hamilton Position Reporting

Don't be a Show-off



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GoPro® Safety

With the increasing popularity of the GoPro® and other brands of action camera, pilots need to carefully consider the safety implications before introducing one into the cockpit, or mounting it externally.



Personal Preflight 7

Personal Preflight

You would never fly an unsafe aircraft, so why fly when you aren't in top condition? Conducting a personal preflight is challenging because we are notoriously bad at assessing our own performance – it's a discipline that takes practice.



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Hamilton Position Reporting

Pilot position reports are vital – controllers rely on them to aid their own situational awareness and the sighting of aircraft. Recent incidents at Hamilton show that pilots are failing to make required position reports – including those in the AIP, and the downwind circuit report.



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Don't be a Show-off

Showing off to your passengers or spectators on the ground can have tragic consequences – but there is a legal and safe way of demonstrating your prowess and winning respect.

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Cover: Carefully consider the relevant Civil Aviation Rules before mounting an action camera internally or externally.
Photo: istockphoto.com/liaj

Published by

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Published six times a year, in the last week of every odd month.

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GoPro® Safety

Action cameras are all the go, and the GoPro seems to be a popular choice. Before flying with one, make sure it's mounted safely and remember, your number one priority is flying the aircraft.

Aviation has embraced action cameras since their introduction due to their affordability and versatility. Manufacturers are now beginning to market their cameras specifically to the aviation sector – producing specialised lenses, software to filter propeller distortion, and enticing pilots with 'aviation bundles' or start-up kits.

With the increasing popularity of these cameras, pilots need to carefully consider the safety implications before introducing an action camera into the cockpit, or mounting it externally.

The Distraction Factor

You need to set rules for camera usage during flight – and follow them. Consider when's the best time to turn the camera on, when to record, and when to adjust the settings.

Stephen Hunt, General Manager Air Transport and Airworthiness, discusses distraction management.

"During flight, it's fairly easy to turn the camera on and start recording. But you can become really distracted if you have to start playing with settings – especially when contending with a small screen and glare in the cockpit. If you need to adjust the camera in flight, do so only in straight and level trimmed flight, above 1000 feet and always keep a good lookout.

"Don't even think about touching the camera while performing aerobatics or other manoeuvres near the ground, or during approach and landing.

"Some cameras come with remote controls. Depending on aircraft type, a remote control may need to be approved as they have the potential to interfere with aircraft systems. Make sure it's tethered to prevent a loose article hazard," says Stephen.

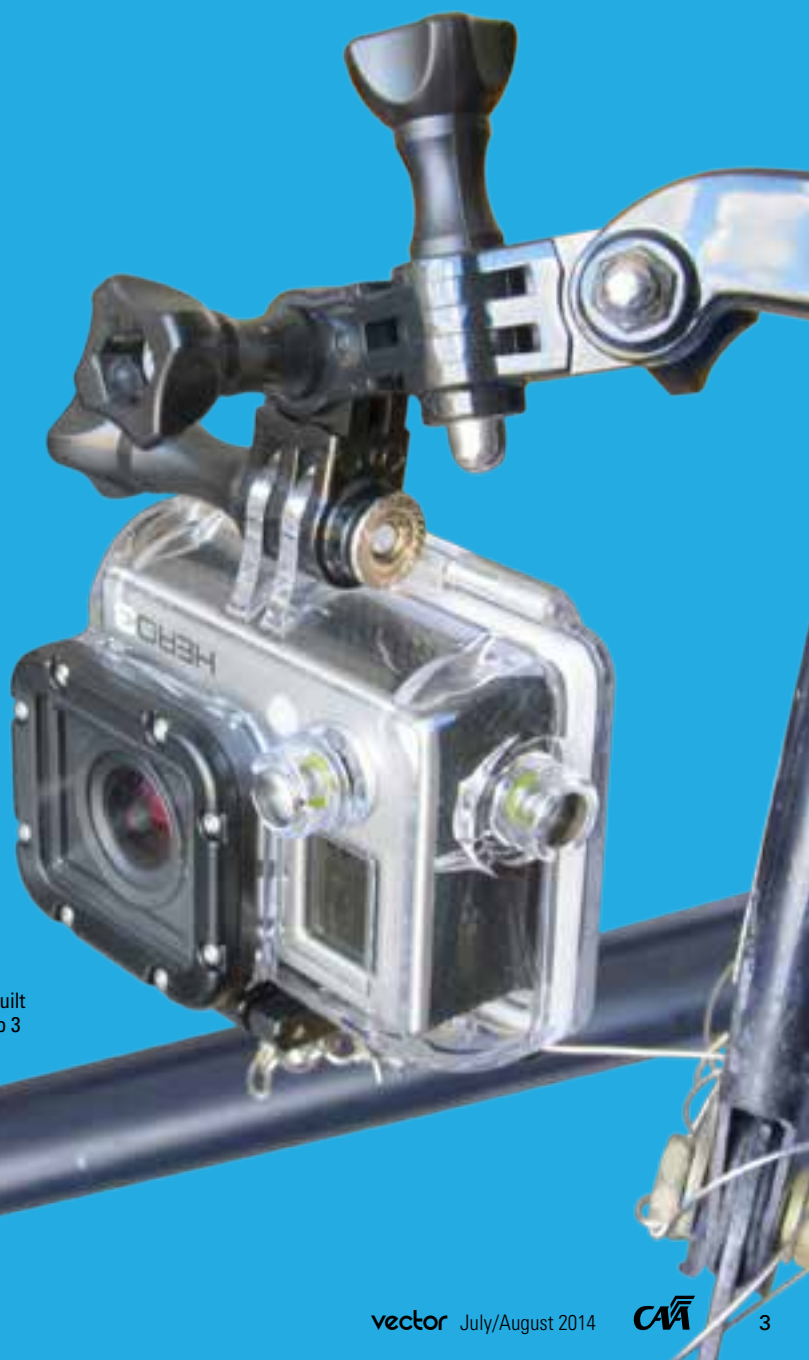
"While flying your aircraft to get your desired footage, you mustn't get distracted by the camera and lose focus on the important tasks of airmanship."


Bruce Cooke mounted this action camera to his amateur-built Avian Adventurer, which he also designed. The GoPro Hero 3 has been mounted on a jury strut, with additional security provided by a stainless steel trace safety cord.

Bruce Cooke, who designed and built his Avian Adventurer aircraft, talks about pilot priorities.

"While flying your aircraft to get your desired footage, you mustn't get distracted by the camera and lose focus on the important tasks of airmanship.

"I will admit to having to abort one takeoff as I was distracted from my pre-takeoff checks by checking that the camera was recording, and failed to ensure the propeller was in fine pitch. Flying the aeroplane safely comes before any camera operation," says Bruce.





Internal Mounting

Carlton Campbell, Flight Training and Standards Development Officer, discusses the internal mounting of cameras.

“Always consider your field of vision when mounting an object in the cockpit. In some aircraft, for example the Cessna 152, your vision is already restricted by the aircraft’s ergonomics.

“Make sure you don’t impede your lookout capability. If blind spots are inherent in the aircraft’s design, don’t compound the issue by mounting the camera in a position which affects your scanning ability. Remember to always scan using a full upper body range of movement to compensate for any blind spots.

“I’ve been flying with students who wanted to record their lessons. One thing you need to consider, is where the camera will fall if the mounting fails. You don’t want it to jam a control input – maintaining full and free control of the aircraft is vital.

“During the times I’ve instructed at Walsh Memorial Flying School, some students attached cameras in the back of their aircraft. This way, if the mounting fails, the camera falls harmlessly into the baggage area. It also minimises the distraction factor by keeping the camera out of the pilot’s field of vision,” says Carlton.

External Mounting Requirements

An externally mounted camera may have an effect on an aircraft’s structure or aerodynamics. Carefully consider the relevant Civil Aviation Rules before attaching one.

The following rules refer to the term “modification”. A modification is defined in Part 1 as a design change that generally results in a change to the configuration of a product, component, or appliance.

Type Certificated Aircraft

For any type certificated aircraft, any external mounting of an action camera would be a modification, and must be

assessed by a Part 146 certificated design organisation, or the CAA Aircraft Certification Unit – both of whom can approve technical data associated with the modification.

Special Category Aircraft

Amateur-built Aircraft

For amateur-built aircraft, the owner is responsible for making sure the aircraft is airworthy.

The back of the Airworthiness Certificate of a Special Category Amateur-built aircraft lists a set of conditions the owner must comply with. One of the conditions is that if a design change is considered to be a major modification, the CAA must be advised about the nature and extent of the modification before the aircraft is flown.

A major modification is defined in Part 1 as a modification that could potentially affect the safety of an aircraft or its occupants.

If the CAA decides the installation of an action camera has the potential to affect the aerodynamics or flight characteristics of the aircraft, an inspection of the aircraft may be required. This will include a flight evaluation to test its airworthiness. During flight testing, the aircraft will be issued with a Special Category Experimental airworthiness certificate.

Light Sport Aircraft (LSA)

LSA aircraft are factory manufactured, and all modifications, including camera mounting, need to be approved by the manufacturer.

Exhibition Aircraft

Operators of exhibition category aircraft need to get any exterior camera mounted by a qualified engineer. A test flight will then be required.



The cameras on this Cessna were fitted by an engineer using an approved modification.

Microlights

Class 1 (single-seat)

The operator of a class 1 microlight doesn't need to get the aircraft inspected when an action camera is mounted externally.

Class 2 (two-seat)

If a class 2 microlight is modified in any way that may affect its airworthiness, the operator needs to get the aircraft re-inspected by a Part 149 organisation's Technical Officer. There are three Part 149 organisations that administer microlight operations:

- » Recreational Aircraft Association of New Zealand Inc, www.raanz.org.nz;
- » Sport Aviation Corp Ltd, www.sportflying.co.nz;
- » Flying NZ (Royal New Zealand Aero Club Inc), www.flyingnz.co.nz.

External Mounting Advice

Bruce Cooke provides some external mounting tips for operators of amateur-built aircraft.

"When setting up a mounting, make sure it's secure – you don't want to lose your camera, and people on the ground don't want to be hit by falling debris," says Bruce.

Rule 91.235 *Dropping of Objects* states that a pilot of an aircraft shall not allow any object to be dropped from that

aircraft in flight, unless the pilot has taken reasonable precautions to ensure the dropping of the object does not endanger persons or property.

"Putting a safety stop on the camera is essential, as long as the stop length doesn't leave a camera flailing around in the airstream where it could do more damage.

"Cameras must not be attached to control surfaces, or in a position that will affect airflow over controls or critical lifting surfaces. You should even be careful installing ahead of the aileron bays, as turbulence off the camera housing could create unexpected results.

"Suction cup mounts seem to be a popular fixture, but they should never be mounted externally on an aircraft. I have used one inside the cabin, stuck on to one of the overhead windows, and the results were quite good. I have found, however, that the suction mount will fall off quite easily, especially if the pressure difference is enough to negate the suction effect and vibration easily dislodges it.

"Stick-on mountings can be quite useful, but take care to ensure the surface is suitable to attach it (not recommended on fabric coverings) and the surface is clean, dry, and oil free. Curved stick-on mounts are available, and these may be better on some surfaces as they may allow better contact for the adhesive.

"Where the structure allows, tube mount clamps are the most secure, but ensure the clamp matches the tube diameter to ensure a positive fit," says Bruce. ■

Captain Brian Retires

After 65 years, 20,000+ flying hours, 100,000 aviation safety posters and zero accidents, Captain Brian Dunn, Air Transport Inspector Flight Operations, is off and away into retirement.

Captain Brian, as he is universally known at the CAA, retired on 20 June 2014, after a career that began in a Tiger Moth in 1949. He went on to fly myriad aircraft, from a Vampire strike jet for the RNZAF to a Boeing 767 for Air New Zealand.

Captain Brian's career has been dedicated to safe flying, because he learned the lessons early and hard.

"I had a bit of bad luck near the end of 1951. I had a very good instructor, Flight Lieutenant Dereck Varkevisser, a Dutchman from the Royal Air Force. A fellow student spun off a gliding turn and killed him. That upset me very much because I thought the world of him."

He did not realise it at the time but now says the death of his much-admired instructor triggered what Captain Brian calls his "safety ethic".

"You have to understand that with aeroplanes, the risk is always there. Every time you open the power levers, it's there. That's why you mitigate risk. Flying's not for cowboys."

Captain Brian was renowned among the young pilots he flew with for his "one day commitment".

"On the first morning we flew together, I would ask them what they had done to get as far as they had, and I would ask them what their ambitions were. Their stories were always very impressive and I would tell them that. But I would also say, 'what you have done to get here is history, it's gone and there's not a thing we can do about what's happened in that era. Your ambitions are for tomorrow and that's not here yet. We've only got today to achieve anything. So I want you to resolve right now, that you will not let anything arise today that is going to break this aeroplane.

'And when you come to work tomorrow, I'm going to make you resolve again that you'll not let anything arise to break the aeroplane. I want you to promise me that every day you come to work you will make this resolution. There's no need to be greedy, you only need to do it for one day.'

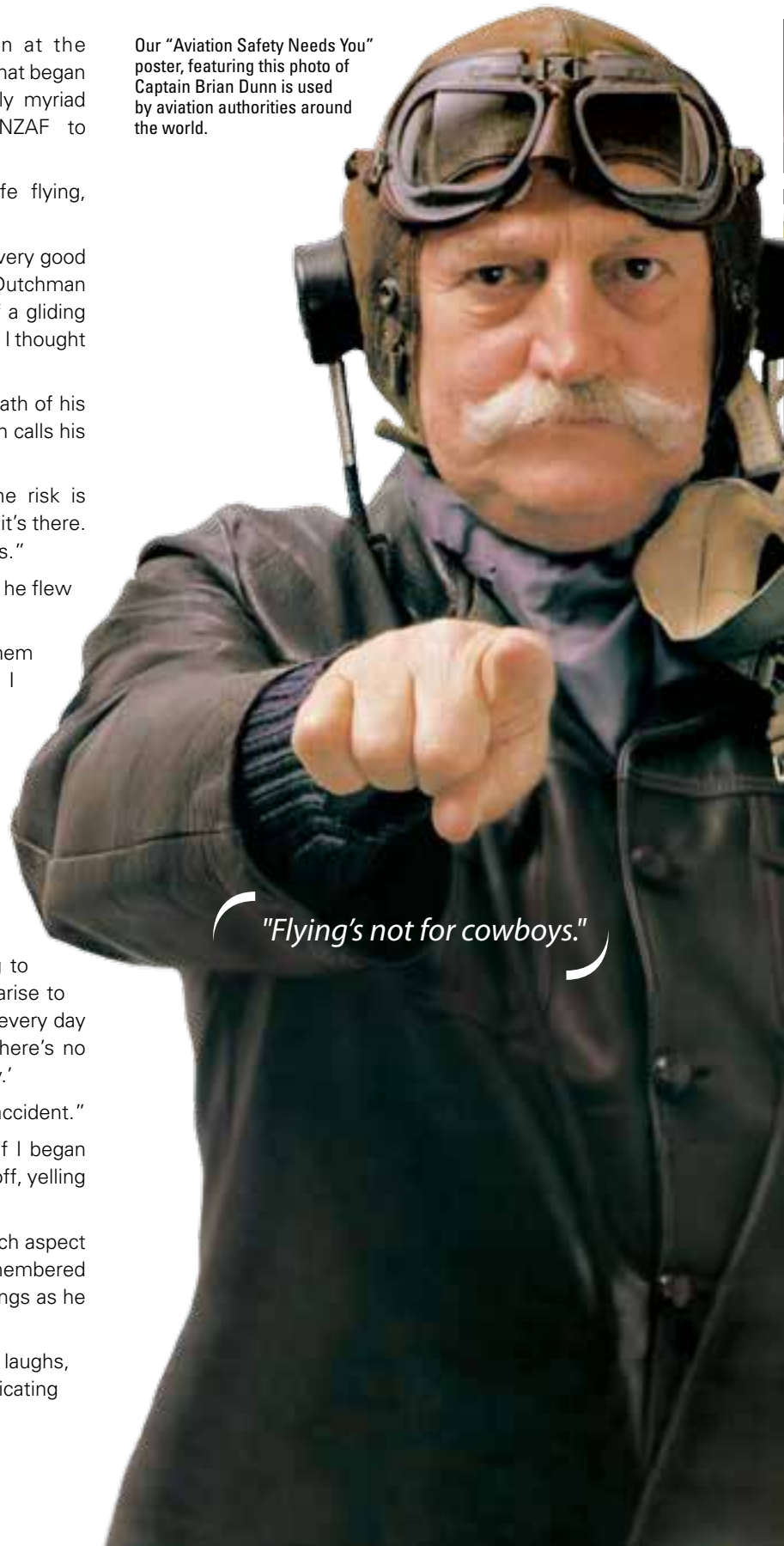
"And those young pilots and me – we never had an accident."

He grins, "Sometimes, during a meeting of pilots, if I began my little piece of advice again, they would all cut me off, yelling 'we know, we know!'"

But the philosophy works. When pressed to say which aspect of his astonishing career he would like to be remembered for, he eventually says the fact he had as many landings as he had takeoffs.

"Or perhaps more landings than takeoffs," he laughs, "You know. Bump, bump, bump," his hand indicating a bouncy landing. ■

Our "Aviation Safety Needs You" poster, featuring this photo of Captain Brian Dunn is used by aviation authorities around the world.



"Flying's not for cowboys."

Personal Preflight

You've completed your planning, the aircraft is ready, but have you completed your Personal Preflight? You would never fly an unsafe aircraft, but are **you** in top condition?



The safety of every flight hinges on the competency of the pilot. If you're off your game, whether it be with a cold, the effects of new medication, fatigue, a hangover or worse, your ability to make important decisions is compromised.

The 2014 AvKiwi Safety Seminars examined the personal factors you need to consider to fly safely.

Here's a snapshot of what was covered, and we've got an online course too.

Stress

Dr Claude Preitner, CAA Senior Medical Officer, describes the causes and effects of stress.

"Stress can occur as a result of high physical or mental demands, but it can also build up over time in an insidious way, potentially becoming a chronic condition. Stress can lead to a deficit of attention, anxiety, and to poor performance.

"Try to find and fix the causes of your stress, whether it is work, family, finances, poor lifestyle, or a combination of those," says Claude.

To Fly or Not to Fly?

For many of us, flying is one of the great stress relievers. If you have already reached a critical stress level, however, you may not be able to safely go flying. There has to be a point at which you call it quits.

When it comes to single-pilot flying, your mental state is even more important – there isn't a second pilot to catch your mistakes or provide feedback.

Stress Management

Exercise helps – it's good for your health and can help you sleep better and feel more rested.

There are numerous mnemonics and models you can use to analyse situations that are causing you stress. One example is the 4 As – Avoid, Alter, Adapt, and Accept.

But as Claude says, stress is insidious – it's often easier to recognise stress in others than it is in ourselves.

Look for the warning signs. People who are stressed tend to:

- » Disregard or minimise safety issues and put themselves or others at risk.
- » May have mood changes, seem depressed, or exhibit symptoms of anxiety.
- » Lose confidence, talk about sleeping badly, have slow reactions, or behave oddly.
- » Are less able to get along with people that they used to work well with.
- » Develop long-term health problems such as physical or psychiatric disease.
- » Become irritable and indecisive, or perform poorly and make more mistakes.
- » Drink more alcohol/coffee/stimulants than usual, or use recreational drugs.
- » Suffer physical symptoms, for example, frequent headaches and stomach upsets.

Seminar Audience Ticks the Box

Rose Wood, Team Leader Safety Promotion, told the seminar audience, "all of you here tonight have ticked the first box in personal preflight safety.

"People who attended had a choice about what they did that night – and they chose to turn out, some of them in terrible weather, to understand more about the importance of including themselves in their preflight checks.

"Conducting a personal preflight is challenging because we are notoriously bad at assessing our own performance – it's a discipline that takes practice."

The Personal Preflight AvKiwi Safety Seminar was presented in 31 venues and attended by over 2,000 people.

Fatigue

We are poor judges of our ability to perform when fatigued – one of the first symptoms is a reduction in our ability to self-evaluate.

Some people see fatigue as a sign of weakness. The reality, however, is that fatigue impairs our own performance in a similar way to alcohol. Lack of sleep, or a disrupted sleep pattern, leads to a substantial loss of physical and mental ability.

The most obvious cause of fatigue is a lack of sleep. The amount of sleep needed differs from person to person, but for most adults the required amount is around eight hours a day.

Sleep Quantity vs Quality

The quality of sleep is just as important as the quantity of sleep.

Sleep deprivation refers to cumulative sleep debt – the quantity of sleep. But the quality of sleep is affected by sleep disorders.

One such sleep disorder is obstructive sleep apnoea. We may not think that snoring is something to be overly concerned about, but if you are a frequent loud snorer, you could be suffering from this potentially serious disorder.

For more information, see “Obstructive Sleep Apnoea” *Vector* (September/October 2013).

There’s also information on the CAA web site, www.caa.govt.nz, “Medical – Medical Information Sheets”.

The Risks

Performance continues to worsen the longer a person goes without sleep. Brief episodes of involuntary sleep, called micro sleeps, occur as the need for sleep increases. Often, these sudden transient bursts of sleep go unnoticed.

With ongoing sleep deprivation (cumulative sleep debt), feeling sleepy can become the new ‘norm’ and may result in an increasing lack of insight into personal performance.

As with road transport accidents, fatigue is increasingly recognised as a causal factor in aviation. To evaluate your fatigue level, see the questionnaire on page 10.

Sleeping Smart

When we’re fatigued, sleep is the only antidote. It doesn’t have to be hour for hour to compensate for sleep debt, but the quality of sleep is paramount.

Here are a few tips:

- » Avoid exercise within two to three hours of bedtime, and avoid caffeine and alcohol within five to six hours of bedtime.
- » Don’t go to bed hungry or full – possibly eat a light snack before you go to bed.
- » If you’re feeling drowsy during the day, a short nap of 15 to 20 minutes can be a very effective way to regain alertness and decision-making ability.
- » It’s best to keep naps short to avoid entering the deep part of the sleep cycle. Getting woken up from a deep sleep often leads to sleep inertia – that groggy, drowsy feeling.

For more information, see “Fatigue Management”, *Vector*, January/February 2014.

Alcohol and Other Drugs

Do you know what New Zealand’s ‘bottle to the throttle’ rule is? Trick question – there isn’t one. Part 19 requires that an aircraft should not be operated by a pilot who is impaired in any way. That means you should fly with only a **zero** blood alcohol level.

Some operators encourage safe alcohol consumption patterns in their aviation personnel by having ‘bottle to the throttle’ policies for their staff.

But such policies can’t be taken literally, cautions Claude.

“Those working in aviation also need to realise it’s unsafe to fly with a hangover. Your balance system can be affected for longer than one day, perhaps even two days, following binge drinking. Alcohol consumption results in dehydration and it may take up to 24 hours to fully rehydrate – your body may need up to 12 glasses of water.

“So if you binge drink, you are not fit to fly for at least 24 hours, probably much longer than that,” says Claude.

For more information, see “Recreational Drugs and Aviation”, *Vector*, March/April 2014.

Hydration

Did you know that if you are thirsty, you are already dehydrated and have lost the edge?

While flying, we lose up to a litre of moisture per hour. An 800 ml loss of fluid is all it takes before our cognitive ability becomes impaired.

If you are thirsty when preflighting, rehydrate before departing.

Dehydration is usually associated with hot weather, but it’s just as important to keep up fluid intake in colder conditions. When cold, our bodies restrict the blood flow to our extremities, which causes fluid overload in the central part of the body. Our kidneys will then attempt to reduce the fluid load by increasing urine output. That is why we experience a greater need to urinate when it’s cold.

Nutrition

Omitting meals, or eating at the wrong time, can lead to low blood sugar – hypoglycaemia. It can impair our mental function and make us more susceptible to airsickness.

To avoid hypoglycemia, don’t skip meals. The body needs a steady supply of nutrients – this is also good advice for passengers.

Additionally, eat a healthy balanced diet. That will not only give you the necessary energy for the day, it will also help reduce fatigue.

Medication

The Federal Aviation Administration (FAA) investigated 90 fatal accidents between 2004 and 2008 that occurred during approach and landing. They found that 42 per cent of the pilots who died had drugs or medication in their blood. The most prevalent drug (6 per cent) was diphenhydramine – a highly-sedating medication found in many over the counter cold and flu tablets.

When self-medicating, we should ask, "What are the dangers?" and, "Should I be flying?"

If you have to self-medicate for more than a few days, seek advice from a medical practitioner. It's likely you shouldn't be participating in any aviation-related activities, including air traffic control and aircraft maintenance.

Make the Hard Call

Sometimes you need to **Step In** when someone is about to do something you think could endanger themselves or other people.

Other times you need to **Step Out** when someone raises concerns about your fitness to fly.

Occasionally you need to **Step Up** and be the role model.

Step In

You might see someone who is about to go flying, and you can clearly tell they are not fit to fly. It's important to be able to step in and intervene.

Those conversations aren't easy to have. Here are some tips to help you frame what you might say:

- » Try to imagine what it will sound like to the other person. If you are someone they respect and look up to, then the conversation will probably go well. If you're not, you probably need to approach it differently.
- » Most people will get defensive if you say to them outright that you believe their decision is the wrong one.
- » Don't try to control their reaction, just prepare yourself for their likely response.
- » Learn their story, or their point of view and what is driving them to make this particular decision.
- » Express your view, while thinking like a mediator. For example, "Are you OK? You seem a bit stressed today".
- » And if you really need to cut through to them, "(Name) I really need you to listen to me". It works surprisingly well.

Step Out

Just as it's hard to discuss someone else's fitness to fly, it's also a difficult conversation to have when the situation is reversed and you are the centre of attention.

If someone approaches you, and attempts to have that conversation, take a deep breath and try to be open to what they are saying – it's coming from a place of concern.

Understand that:

- » They have probably spent time building up the courage to talk to you. Try to imagine having this conversation from their perspective.
- » You need to be open to what they are saying. Take some deep breaths and try to understand where they are coming from.
- » They are clearly worried about you, and that means they take your safety seriously – just as seriously as you need to.

Step Up

We all want to be part of a safety culture that stops people from harming themselves and others.

You can be a role model by stepping up and setting a good example to those around you.

Carlton Campbell, CAA Standards Development and Training Officer and AvKiwi presenter, urges instructors to step up.

"We expect instructors to capitalise on all AvKiwi Safety Seminar messages and incorporate these into their training programmes."

Personal Preflight Online

The Personal Preflight Online Course can be found at:

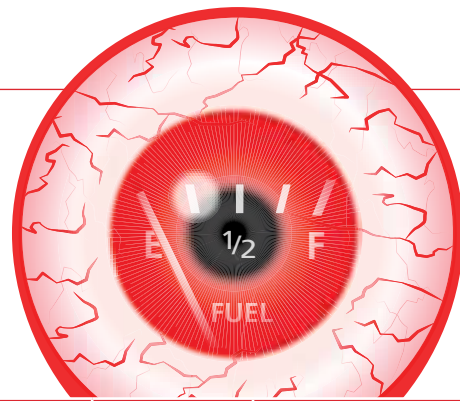
www.caa.govt.nz/avkiwi



Photos: istockphoto.com/EEL_Tony and istockphoto.com/GlobalIP

How Fatigued Are You?

You can self-evaluate by using the following driver fatigue test supplied courtesy of ACC, adapted from information provided by the Automobile Association and Dr Phillipa Gander.



Calculate your Driver Fatigue Rating

Use the questions below to see if you are affected by fatigue.

Risk factors	Score	Your score
Less than 6 hours' sleep in the past 24 hours	3	
Less than 14 hours' sleep in the past 48 hours	2	
Awake for more than 16 hours	3	
Worked night shift in the last three days	2	
Have a sleep disorder	3	
Driving between 1 pm and 3 pm	1	
Driving between midnight and 6 am	3	
Had any alcohol in the last two hours	2	
Either driven for more than five hours without a break Or driven for more than eight hours without a break	2 3	

Add up the column to calculate your total score:

If your score is less than 4 – think about fatigue prevention. Keep drinking water and eat regularly.

If your score is 4 – be careful, you are at risk of having micro-sleeps. A 20-minute power nap will help.

If your score is 5 to 7 – you are a serious driving hazard. Don't drive without having a 20-minute power nap first.

If you scored 8 or more – you are an extreme driving hazard. Don't drive at all. You need a full night's sleep first – eight hours.



Posters can become 'wallpaper', so you need to regularly refresh the messages. Order all three posters and rotate them to catch people's attention. Order by emailing info@caa.govt.nz.

Paraparaumu MBZ Concerns

The M in MBZ stands for Mandatory, a point that seems to have escaped a number of pilots who have deliberately or unwittingly flown through the Paraparaumu MBZ without talking to anyone. And that's a worry.

The requirements for operating in a mandatory broadcast zone (MBZ) are set out in rule 91.135, and summarised in *AIPNZ*, GEN 5.3. In essence, these require a pilot to report:

- » Position, altitude, and intentions on entry, and at prescribed intervals while in the MBZ;
- » When joining the circuit of an aerodrome in an MBZ;
- » Before entering a runway for takeoff within an MBZ.

In the Paraparaumu MBZ, the reporting interval is (not more than) 10 minutes.

The MBZ is transponder mandatory above 1500 feet, but if you have a transponder, you should operate it on Mode C regardless.

AFIS

This MBZ is unique in that Paraparaumu has an aerodrome flight information service (AFIS) to whom all initial calls should be addressed. Paraparaumu Flight Service will give you aerodrome information including weather, QNH, and known traffic.

'Known traffic' relies on reports from aircraft, and occasionally, the sighting of a transiting aircraft that has not communicated in any way. There have been at least 30 such instances (not including any that sneaked through unnoticed) in the last two years. Some of them were quite close to the circuit area.

Significant Hazard

Paraparaumu is a busy aerodrome, with flight training, gliding, and scheduled IFR airline operations every day of the week.

Non-reporting traffic is of great concern to the CAA, because of the very real risk of an airliner colliding with a light aircraft. One scenario is the airliner emerging from cloud on an instrument approach meeting an unannounced VFR aircraft scudding along just below cloudbase.

Take a moment to consider the worst case – 53 fatalities on the airliner, several on the light aircraft, and probably more on the ground.

Plan, Plan, Plan

Before flying to Paraparaumu or through the MBZ, plan your flight carefully. Above all, plan your radio calls well in advance. Check out the MBZ detail on VNC C2 – it has some tricky features, including three different upper limits. Other chart symbols in the MBZ are a bird sanctuary, a model aircraft danger area, and hang gliding activity.

Only the Runway 16 approach symbol is depicted on the VNC, but full details can be found on the Paraparaumu approach charts in *AIPNZ* Vol 3 (www.aip.net.nz). The Runway 34 approach converges on the coast from the south-west, crossing it just north of Paekakariki, and tracks to the missed approach point 0.8 NM south of Runway 34 threshold.

Avoiding the MBZ altogether could pose problems – it extends up to 4 NM beyond Kapiti Island to the west; and from Paraparaumu to Pukerua Bay, high ground could make skirting the eastern boundary difficult. It's easier to transit the MBZ as long as you make the right calls.

Some planning resources include:

- » "Just call us Paraparam", *Vector*, September/October 2011;
- » The AFIS sections of AC91-9 *Radiotelephony Manual* and the GAP booklet *Plane Talking*. ■



Antarctica RPAS

By John Brooks, Adjunct Professor, Auckland University of Technology

Safety considerations were to the fore when the Auckland University of Technology (AUT) used remotely piloted aircraft systems (RPAS) in Antarctica in January 2014.

As AUT's chief RPA pilot, I was fortunate to be invited to fly the RPA in Antarctica to photograph cyanobacterial mats in the Taylor dry valley.

Cyanobacteria are blue-green photosynthetic bacteria. They are able to grow in the lakes and streams of dry valleys, blooming as the temperature rises. If global warming is really occurring, the mats can be expected to expand, so mapping their extent from year to year is a way of assessing the impact of global warming on Antarctica.

We have been flying our Kahu Hawk RPA for the last 18 months, developing the technique for studying native flora in a patch of bush close to North Shore Aerodrome. We have conducted flights under an agreement with North Shore Aero Club, and have worked out a procedure to ensure the safety of other airspace users.

I began planning our operating procedures about four months before our departure to the ice. This involved coordination with the United States Antarctic Program, and working through several documents on policy and procedure.

I had already written a Manual of Approved Procedures for the AUT Hawk operations in New Zealand, and that formed the basis of my planning for the Antarctic deployment. There is no designated airspace, as such, in Antarctica. Air traffic control relies on radio and visual methods. Initially, it seemed that we would be permitted to fly only at weekends, or when normal helicopter operations were complete. That would have seriously affected our ability to collect data.

The Taylor Valley is a harsh environment for RPA operations. The valley floor consists of gravels, strewn with rocks and boulders of various sizes, while the weather conditions can

be very windy, with summer temperatures down to about minus 10 degrees Celcius. I had some concerns about the ability of the aircraft systems to work in this environment. So the programme had two parts: to investigate the operation of an RPA in Antarctica, and to map the cyanobacterial mats.

I decided to take two complete systems: the Hawk aeroplane and ground control station (GCS), and a newly-acquired flying wing design, the SwampFox, together with a spare GCS and assorted aircraft spares.

The RPAs, supplied by Skycam UAV, weigh less than 5 kg and fly at about 30 kt, but are capable of about 50 kt. The Fox carries two cameras and is under autopilot control, programmed prior to launch, but manually controllable in flight. All our operations are conducted below 400 ft agl, and the RPAs have loss of communication protocols built in, so that the aircraft either return to base, or deploy a parachute for emergency landing.

On arrival at Scott Base, I arranged to visit Mac Center at McMurdo Station. Controllers working out of the communications centre at McMurdo manage the helicopter flights in and around Taylor Valley, so it was essential that we had procedures sorted out before we began flights. I discussed my proposed operational procedures with the air traffic controllers and helicopter operations manager. I believe the professional way AUT approached its RPA operations had an impact. We were able to work out a satisfactory procedure for early warning and the issue of a NOTAM, permitting us to operate in Taylor Valley within specified time windows throughout the week.



The Fox UAV is hand-launched on the bungee catapult from Fox Field. In the background is Howard Glacier.



The procedure was essentially:

- » The Dry Valley RPA Group notified Mac Center 24 hours in advance of intended RPA operations.
- » Mac Center passed pertinent information to the Remote Operations Facility (ROF) for NOTAM action and email distribution to a specified group list.
- » At 30 minutes prior to commencement, Mac Center was notified, and passed the message to ROF for email group notification. This involved a radio relay via Scott Base, because Mac Center cannot be reached by radio from Taylor Valley.
- » The same communication was made for termination of the RPA operation.
- » Using the callsign "Fox UAV", the Dry Valley RPA operators maintained a radio watch on the helicopter frequency in the 30 minutes prior to launch, and made a broadcast immediately before and after launch. A further broadcast was made when the aircraft landed.

We set up a launch point, named early on as "Fox Field" and laid out four coloured tarpaulins, each four metres square. We could then take ground measurements of the colours to compare with the images collected by the Fox cameras, and by cameras on board the WorldView-2 satellite, which was tasked to fly over the Taylor Valley about 12 times.

With the exception of one relay of the termination notification, our operational procedures worked flawlessly. Seventeen missions were conducted in the two weeks we were in Taylor Valley, collecting around 12,000 high-resolution images.

Our radius of operation increased from about 1 NM to 5 NM as we became more confident in our aircraft performance. We obtained clearance up to 6000 ft amsl on one occasion to fly over Ghurka Ridge. In discussion with helicopter pilots after the event, it was apparent that no problems arose. The pilots were fascinated by the RPA, and Fox Field, which was visible from many miles away.

The Fox RPA performed admirably in winds of up to 34 km/h, and measured temperature down to minus 14 degrees Celcius. The battery packs provided power for flights of around 50 minutes, only slightly less than we achieve in the much warmer conditions in Auckland.

Flying the RPA in Antarctica was a rare privilege, and extended us far beyond what we are currently permitted to do in New Zealand. We now have proven procedures in place for future deployments, and the equipment has been shown to be sufficiently robust to operate in the conditions of the Antarctic summer.

Acronyms

Several different terms and acronyms have been used in the past for these aircraft, such as drones, Unmanned Aerial Vehicles (UAV) and Unmanned Aerial Systems (UAS). The current ICAO name for such aircraft is Remotely Piloted Aircraft Systems (RPAS). ■

John Brooks is a microbiologist who has been fascinated by aeroplanes since childhood. He achieved his aim of learning to fly when he took up gliding in 1979. John began flying RPAs for AUT in 2012.

Hamilton Position Reporting

If you fail to report your position when required, you may be compromising your safety and the safety of other pilots in the control zone.

Air Traffic Controllers rely on pilot position reports to ensure the safety and correctness of all clearances, instructions, and information issued.

Prescribed reporting requirements, such as those in Hamilton's published arrival procedures in *AIP New Zealand*, help to prevent unnecessary radio transmissions and reduce frequency congestion.

Recent incidents at Hamilton, however, show that pilots are failing to make required position reports, including those in the AIP, and the downwind circuit report.

Aerodrome Control Service

At Hamilton, Airways provides an Aerodrome Control Service in the circuit area, and beyond that Flight Information to VFR aircraft. Aerodrome Control's purpose is to prevent collisions between:

- » Aircraft flying in the vicinity of an aerodrome;
- » Aircraft landing and taking off;
- » Aircraft operating on the manoeuvring area;
- » Aircraft vehicles, and persons, operating on the manoeuvring area; and
- » Aircraft on the manoeuvring area and obstructions on that area.

Although radar is available in the control tower, its use in an Aerodrome Control Service is limited to specific applications. The aerodrome controller's primary means of control is by visual reference. That is why pilot position reports are vital – controllers rely on them to aid their own situational awareness and the sighting of aircraft.

Repeatedly having to chase pilots for position reports increases controllers' workload and radio traffic.

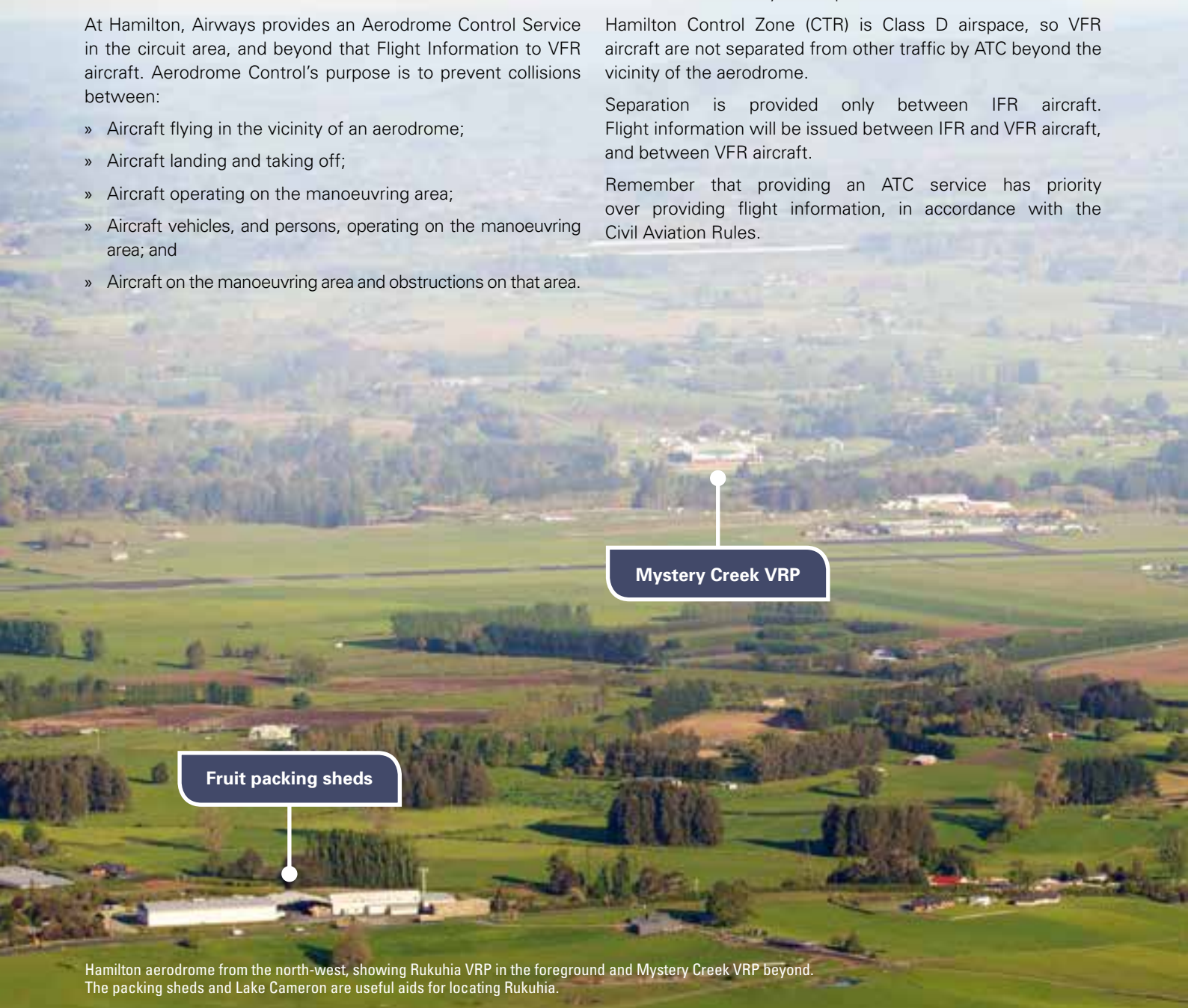
Collision Avoidance

When flying under VFR, the final responsibility for collision avoidance rests with you, the pilot – this is often misunderstood.

Hamilton Control Zone (CTR) is Class D airspace, so VFR aircraft are not separated from other traffic by ATC beyond the vicinity of the aerodrome.

Separation is provided only between IFR aircraft. Flight information will be issued between IFR and VFR aircraft, and between VFR aircraft.

Remember that providing an ATC service has priority over providing flight information, in accordance with the Civil Aviation Rules.



Fruit packing sheds

Mystery Creek VRP

Hamilton aerodrome from the north-west, showing Rukuhia VRP in the foreground and Mystery Creek VRP beyond. The packing sheds and Lake Cameron are useful aids for locating Rukuhia.

VFR Arrivals – Reporting

Before arrival, note the ATIS in advance, and confirm receipt (with the identifier and QNH) on first contact with Hamilton Tower. You need a clearance before entering the control zone, so make sure you receive that before crossing the boundary. If no clearance is received, do not enter the control zone.

A clearance into the Hamilton CTR may be given in plain language, or by a published arrival procedure. Clearances will include traffic information and can be accompanied by joining or holding instructions.

A readback of the arrival procedure is required, including any joining or holding instructions and acknowledgement of traffic information.

If you request a published arrival procedure, however, and are cleared with that exact arrival, there is no requirement to read back the clearance in full. To save radio time, you can transmit your call sign as an acknowledgement.

Published arrival procedures are the Rukuhia arrival (from the west), or Mystery Creek arrival (from the east). Those arrivals feature an altitude band of 1700 to 2500 feet and include a requirement to report when 2 NM from the relevant visual reporting point. In the event the frequency is too congested to make that position report, then the requirement is to hold.

When making any position report, follow the 4 Cs. Make sure your transmissions are:

- » Clear – speak clearly and at a slower pace than normal, and keep it standard;
- » Concise – be succinct and transmit for the minimum amount of time necessary to get your message across;
- » Consistent – sequence information in a logical way. That will make it easier for others to understand;
- » Correct – the situational awareness of others is affected by the accuracy of your position reports.

Report Downwind

In the circuit pattern, your downwind position report will assist the aerodrome controller with sequencing. If you've joined on base or final, report when established or as instructed by ATC.

Remember that even after joining the circuit, you must maintain a good lookout.

Hamilton ATC will give your number in the sequence for landing, including advice to report sighting preceding aircraft. Once you have reported traffic in sight, maintain adequate spacing from the preceding aircraft. In the event you lose sight of the preceding traffic, you **must** advise ATC. If you are uncertain about the circuit sequence, seek clarification from ATC immediately. ■

Further Reading

- » "In, Out and Around Hamilton", *Vector*, November/December 2012.
- » *Plane Talking*, Good Aviation Practice Booklet. Email: info@caa.govt.nz for a free copy.
- » *Plane Talking* online course, AvKiwi Safety Seminars, see:

www.caa.govt.nz/avkiwi

Rukuhia VRP

Lake Cameron

Don't be a Show-off

Trying to impress your passengers, or spectators on the ground, with your handling abilities and superior skill can have consequences way beyond the momentary thrill. The accident and enforcement files are thickly populated with examples of pilots showing off.

Aside from the obvious consequences of death and injury, the effects can include:

- » Scaring people off flying for the rest of their lives;
- » Putting them off flying with you in particular;
- » Having them share their lunch with you and the other passengers – after lunch;
- » Witness or passenger complaints leading to administrative action or prosecution.

We discussed some worst-case accidents in the article "Déjà What?" in the July/August 2011 *Vector*, as well as the spontaneous versus premeditated decisions to show off.

One recent enforcement case appeared to show an element of premeditation. A helicopter pilot was taking a bridal party to their wedding venue at a remote location, and on the way, was observed on radar flying below 500 feet.

On arrival, the helicopter 'zoomed' up the steep slope below the venue, and appeared suddenly in a steep climb in front of the assembled guests.

While that may have seemed impressive to some, their number did not include the judge that the pilot subsequently appeared before. He imposed a fine and costs totalling nearly \$2500.

A Simple Error of Judgement

A fatal accident on a West Auckland beach over 15 years ago was the result of a misjudgement of what should have been a relatively simple, but illegal, exercise.

The pilot took off from the short beach, turned to seaward briefly, then started a low-level reversal turn towards the land. The inferred intention was a fly-by for his friends on the beach before returning to base.

Part way through the turn, the PA-18 stalled and 'flicked' into a spin, with no height available for recovery. The pilot died, and the passenger was seriously injured.

The investigation report discussed the possibility of the pilot not having allowed himself enough room to make the reversal turn. Also, the beach was partly hemmed in by high ground, which may have given a false horizon effect and resulted in an airspeed reduction during the turn.

The situation could have been mitigated by more altitude, a greater distance out to sea before reversing the turn, or both. There was always the option, of course, of not doing the fly-by at all – something to think about if ever you're tempted. If something can go wrong, it probably will.



It did for an aero club pilot some years ago, but he got off relatively lightly. He went on a solo training flight, and it was the Chief Flying Instructor's (CFI's) day off. He thought he might get away with doing a 'beat up' of a friend's property. As he flashed along the friend's driveway, he saw three people standing there instead of the expected two. The third was the CFI on a social visit.

Smile for the Camera

It's hard to do anything these days without someone capturing it on camera – everybody seems to have one, be it a phone camera, iPod, or similar device. Occasionally, you can be a YouTube star even before you've got home from whatever you've been doing.

Some YouTube postings have led to complaints to the CAA about unlawful or dangerous flying.

But There is a Way

Despite the title of the article, there is a way to show off your flying prowess, and it's both legal and safe. Professionalism always impresses, and it's an ongoing rather than occasional thing.

This can start before the flight, especially if you're taking someone up for their first time. For example, walk them through your preflight inspection, explaining what you're doing as you go. This is a confidence builder in itself, and the passenger can feel reassured that you have their safety at heart.

A comprehensive safety briefing is also a good idea. They will know what to expect on the flight, and the reasons why things are done a certain way. Involving them from the outset as a second pair of eyes can help ease nervousness and reduce the likelihood of airsickness. Explain too, the need to equalise pressure in the ears during descent.

Smooth and Accurate

Smooth and accurate manoeuvring will win you respect, and can steadily improve your skill at the same time.

For instance, in level flight, aim to have the hundreds hand of the altimeter bisecting the zero, or lined up with the appropriate index mark. Set your personal tolerances for airspeed in the climb or descent – say, by aiming to beat the flight test limits.

Make turns at moderate bank angles, remembering that even 25 degrees can seem vertical to the uninitiated. Gentle entry and exit can be achieved with good anticipation, avoiding abrupt or jerky control inputs at all times. Similarly, try not to make sudden power changes, both for engine handling considerations and the startle effect on your passengers.

Where possible, plan your flight to avoid known or likely turbulence. The GAP booklet *Mountain Flying* can help here. If you know that turbulence is a possibility, tell your passengers beforehand, along with a simple explanation of what causes it.

A perfect landing (always strive for it – they do happen occasionally!) will round off what will have been an uneventful and enjoyable flight for your passengers.

Look and Act the Part

Looking and acting professionally creates a good first impression, and adds to passenger confidence.

Professionalism includes not responding to passenger or peer pressure to do something 'thrilling'. If that's what people want, refer them to a Part 115 operator. Or suggest they go to Queenstown or the Gold Coast for some ground-based thrills.

One of the best comments on your professionalism, albeit in a reverse sense, is, "Gee, that was boring!" Another is "(yawn) Oh, we're there already!" Think about it. ■

Further Reading

- » "Déjà What", *Vector*, July/August 2011;
- » Accident reports 10/885 and 98/3405, on the CAA web site, www.caa.govt.nz, "Accidents and Incidents".

*Smooth and accurate manoeuvring
will win you respect...*

Aviation Safety Coordinator Course

Queenstown
20 to 21 August 2014

Novotel Queenstown Lakeside
cnr Earl St and Marine Parade
Queenstown

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

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

Attend this free two-day course to train new aviation safety coordinators, and to refresh and re-inspire existing ones –

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



Improving Part 66 Aircraft Maintenance Personnel Licensing

The Civil Aviation Authority is considering changes to the licensing structure and qualification requirements for aircraft maintenance engineers – we need your input.

In addition to a general review, this project aims to:

- » Update aircraft maintenance licensing and training requirements to better align with best practice and international standards; and
- » Account for new and emerging aircraft technology.

Rick Ellis, CAA Aviation Examiner – Maintenance Engineering, is part of the review team.

“The CAA has recognised that New Zealand’s aircraft maintenance licensing requirements are out of step with other regulatory authorities. In addition to the need for changes to the licensing structure, there’s also a need to review training requirements, such as the lack of on-going recurrency training.

“Through the review, we aim to improve the licensing structure so ratings can be attained in a reasonable amount of time. The review will also identify other areas where we can minimise expense to industry,” says Rick.

Consultation on identifying the issues with Part 66 and the licensing system will begin soon. When available, a discussion document and details on providing your views will be on the CAA web site, www.caa.govt.nz, “Maintenance Engineers”.



Photo: ©istockphoto.com/GlassEyeStock

Get Updates by Email

If changes to Part 66 are needed and the government agrees, there will be future opportunities to comment on specific rule changes.

Keep up-to-date by subscribing to our free email notification service.

www.caa.govt.nz/subscribe

Turbulence Wake-up Call

Many of us associate the dangers of wake turbulence with large transport aircraft, but one New Zealand pilot found that isn't always the case. He describes his startling encounter.



It was a stunning morning, not a breath of wind and not a cloud in the sky. What could possibly go wrong?

After a short flight, I met my fellow aviators at an airfield with long grass runways. We were all heading to the same event, and decided to fly in loose formation.

We decided that I would be the last to leave, as my aircraft was slightly faster. A pilot for more than 40 years, I have flown on the front and the back ends of a rope, taught formation flying and ... declined clearances because of possible wake turbulence.

At 0815 I was lined up to the right of and behind the preceding light biplane. Once it was airborne, I took off, keeping out to its right. Airspeed and positive rate of climb checked – then the left wing dropped slightly.

Just as I levelled the wings and thought about changing the climb profile, the left wing dropped past 60 degrees – the aircraft was rapidly going down. In all the time I have been flying, this was the first unintentional loss of control, and it was scary. I fought it all the way, and full opposite rudder and aileron gradually had the desired effect.

For a millisecond I thought of those pilot's famous last words, "I think I can save it". The wings were almost level when I arrived heavily back on the runway. The canopy came off, and we slid a considerable distance down the runway.

Once the slide stopped, I turned everything off and climbed out (easy with no canopy!). I was stunned, but after ascertaining

there was no fuel leaking, I turned on the radio, checked the ELT, and called my friends. It was obvious I had made a mess of things and could only blame myself. Wake turbulence was considered before takeoff, but not enough caution was exercised.

In hindsight, plenty of 'what-ifs' come to mind: What if it wasn't a stream takeoff and was more in formation? What if there was more wind? What if I had followed directly then moved out to the right? What if I waited longer to roll? A lot of pilots I have spoken to are astounded that the aircraft in front put out so much wake turbulence – none more than me.

Many other pilots have 'close call' stories to tell about wake turbulence. "There I was, 90 degrees to the runway with nothing on the dials but the maker's name...". I have heard those stories only after the event. Was I blasé about wake turbulence? No, but three minutes does not seem too long to wait any more.

I had a couple of thoughts after this incident. The aircraft could have ended up on its back, and although it has very little roll-over protection, it does have full-harness seat belts.

This happened on an uncontrolled airfield. Had I not survived, how would the accident investigators come to the right conclusion after the event, given the perfect flying conditions and full integrity of the controls? Also, how does one log a flight that lasted seconds? I couldn't taxi, but I did walk away. ■

Police Seeking Paul Bennett

Christchurch Police are appealing for information on the whereabouts of a couple wanted in relation to a warrant to arrest.

Police want to locate and speak to Paul James Bennett, who also goes by the name of David Kite, or Dennis Kite, and his wife, Simone Anne Wright, also known as Sarah Kite.

Detective Sergeant Craig Farrant of the Christchurch Police says both are wanted on a current warrant to arrest.

"The pair use multiple aliases, and we do not know what identities they are currently travelling under, or where they are. If anyone has information that can help us locate the couple, we would ask them to give that information to the police."

Contact Christchurch police, tel: 03 363 7400. Information can also be provided anonymously to Crimestoppers, tel: 0800 555 111.

The CAA has received information that Mr Bennett may be interacting with members of the aviation community and/or actively seeking opportunities to fly aircraft. Mr Bennett does not currently hold a valid New Zealand pilot licence or medical certificate.

The CAA warns aero clubs, airlines, and aircraft owners to be vigilant in checking bona fides and aviation documents, such as pilot licences and medical certificates, before allowing people to fly. The documents must be current and they must be produced on request. If you have any concerns, or wish to verify information about a person's aviation documents you are welcome to contact the CAA, email: info@caa.govt.nz. ■



These photos show some of the different appearances of Paul Bennett, and his wife Simone Wright. Photos supplied by New Zealand Police.

Chief Flying Instructor Seminar

The CAA will hold a Chief Flying Instructor (CFI) seminar 14 to 15 October 2014, at the Brentwood Hotel in Wellington.

Background

Many instructors have recently been recruited into airline positions. This has resulted in the reduction of experience available to GA flight trainers.

This industry movement, coupled with concern over flight training accidents this year, were two of the reasons that led the CAA Personnel and Flight Training Unit to consider holding a CFI seminar.

Expressions of interest were sought from industry. The decision to conduct the seminar was taken following the positive response.

Registration

Registration will be open in August to CFIs and Deputy CFIs from training organisations. Those with an offer of a CFI role may also be considered for registration for the course – that is dependent on the numbers.

It is envisaged that the seminar will be held regularly from now on, so future CFIs will be able to participate.

More details of the 2014 CFI seminar will be available on the CAA web site, www.caa.govt.nz, "Seminars and Courses".

To receive updates, subscribe to our email notification service, www.caa.govt.nz, "Email Notification Service". Select "Flight Instructors". ■

Project **DEEPWAVE**

This important atmospheric science research project was introduced in AIP Supplement 58/14, and later in a series of NOTAMs detailing daily operations between 5 June and 21 July 2014.

The project, which will ultimately benefit aviation, involved research agencies from the USA, the UK, Germany, Austria, Australia, and New Zealand. The focus was on 'gravity waves' and their likely effect on local weather and global climate.

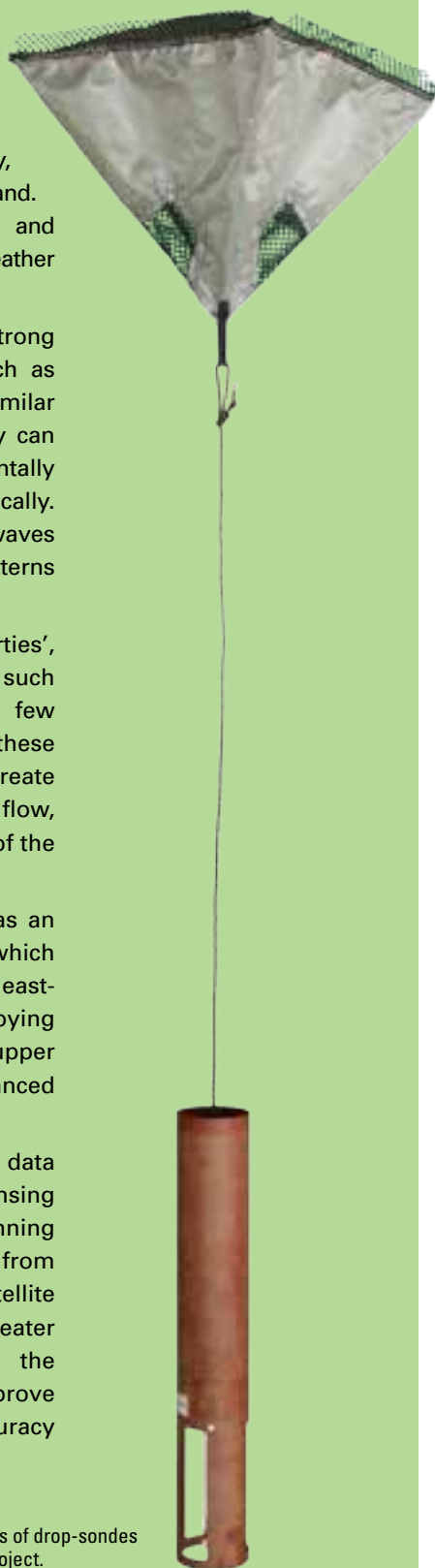
Gravity waves form when strong winds strike a large obstacle, such as a mountain range. Dynamically similar to ripples or waves on water, they can travel hundreds of kilometres horizontally and more than 95 km vertically. 'Breaking' of these high-altitude waves can materially influence weather patterns at much lower altitudes.

Situated in the 'Roaring Forties', New Zealand is ideally placed for such a study, being one of the very few obstacles to the westerly airflow at these latitudes. The Southern Alps create a gravity wave 'hotspot' in the flow, aided by the seasonal positioning of the Southern Polar Jetstream.

A major player in the exercise was an American Gulfstream V aircraft, which operated above 40,000 feet on long east-west night transits. As well as deploying drop-sondes, it conducted upper atmospheric soundings using advanced laser scanning technology.

The results were supplemented by data from a German atmospheric-sensing Falcon 20 jet, a ground-based scanning laser, weather balloons released from several South Island sites, and satellite data. That material will enable greater insight into the mechanics of the atmosphere, and ultimately improve forecasting reliability and the accuracy of long-term climate predictions. ■

One of the hundreds of drop-sondes deployed on this project.



National Airspace and Air Navigation Plan

The National Airspace and Air Navigation Plan will now move into three implementation stages, 2014/15, 2018, and 2023 under the name "New Southern Sky".

This was announced by Transport Minister Gerry Brownlee on 16 June 2014.

New Southern Sky is an ambitious ten-year programme being led by the CAA to modernise the New Zealand aviation system.

At the launch, the minister outlined the economic and safety benefits the plan will bring. As well as improved safety, New Southern Sky will mean more than \$2 billion in fuel savings, aircraft operating costs, and airline operator capital expenditure over 20 years.

For more information, see the CAA web site, www.caa.govt.nz, "National Airspace and Air Navigation Plan", where you can also subscribe to receive email updates. ■





Des Barker Seminars

The CAA is bringing the world-famous airshow safety guru and veteran pilot, Major-General Des Barker, South African Air Force (retired) to New Zealand early in 2015.

Des Barker is the author of *Zero Error Margin*, widely regarded as the bible for organising air shows.

Rex Kenny, Manager Special Flight Operations and Recreational Aviation, says, "New Zealand already has an excellent safety record at airshows, and we want to keep it that way. Having Des here to share his knowledge and experience will be of immense benefit in making sure that continues to happen. We want as many as possible to benefit from this visit."

Des will be presenting seminars at Masterton, Ardmore, Wellington, and Queenstown/Wanaka during January and February 2015. The seminars are likely to be free to attend.

The topics covered during the seminars will be those of interest to a cross-section of aviators.

Dates and venues will be published in a future *Vector*, after they have been finalised. Updates will also be available on the CAA web site, under "Seminars and Courses".

The CAA would like to hear from those interested in participating. To register your interest in participating, or to get more information, please contact Jeanette Lusty, Team Leader, Flight Operations, Adventure Aviation, email: Jeanette.Lusty@caa.govt.nz ■

Integrated Flight Training for CPL MEIR Pilots

The CAA has developed a draft policy for an integrated CPL multi-engine instrument rating (MEIR) for airline pilots. The policy was presented to industry at the Aviation Industry Association (AIA) Leadership Summit in Wellington in July.

The policy meets a long-standing demand from the aviation industry. It provides a framework within which industry can develop a CPL MEIR course conforming to internationally recognised and accepted standards.

Drafting of the policy has involved gathering information from industry proposals, and other organisations such as ICAO, EASA, NZQA, and the AIA.

The course will be competency-based. Other details are to be finalised.

Once course development is complete, New Zealand flight training organisations will have a product that can be marketed internationally.

For more information, contact CAA's Principal Aviation Examiner, Bill MacGregor, email: Bill.MacGregor@caa.govt.nz ■

Hourly Rate Increase

In 2012, the Government approved a new funding framework for the Civil Aviation Authority that came into effect on 1 November 2012. The new framework was designed to move the CAA toward full cost recovery for most services.

The last of these changes occurred on 1 July 2014 with the standard hourly rate charge (for all chargeable services) increasing from \$244 per hour to \$284 per hour, including GST.

More information on the fees and their background can be found on the CAA web site, www.caa.govt.nz, "CAA Funding". ■

Robinson Helicopter Briefing

Robinson Helicopters have accepted the CAA's invitation to give a safety awareness briefing on the R44 and R66 at Ardmore 3 November and Queenstown 4 November 2014.

The one-day safety briefing and product update will be presented by Tim Tucker, chief flying instructor for Robinson.



There will be an opportunity on the day after for a dual flight with Tim in the R66 or R44.

Numbers for the briefing and flights are limited, so please send your expression of interest to CAA Aviation Examiner, Andy McKay, email: andrew.mckay@caa.govt.nz.

Aviation Risk Management: An Introduction SMS Booklet Four

Booklet Four focuses on two of the 13 key elements of an SMS: Hazard Identification (Element 4) and Risk Management (Element 5).

It explains what Safety Risk Management means and details how aviation organisations can take steps to proactively manage safety risk.



The booklet describes the differences between hazards and risks, and provides methods for hazard identification and risk assessment.

Practical examples on how to develop a risk matrix, risk register template, and a risk management plan, are included in the booklet.

See the CAA web site for more information, including how to order this booklet, or the complete SMS Resource Kit.

www.caa.govt.nz/sms

How to Get Aviation Publications

AIP New Zealand

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

Pilot and Aircraft Logbooks

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

Rules, Advisory Circulars (ACs), Airworthiness Directives

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

Planning an Aviation Event?

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

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

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

CAA Cut-off Date	Airways Cut-off Date	Effective Date
4 Aug 2014	11 Aug 2014	16 Oct 2014
1 Sep 2014	8 Sep 2014	13 Nov 2014
29 Sep 2014	6 Oct 2014	11 Dec 2014

See www.caa.govt.nz/aip to view the AIP cut-off dates for 2014.

Aviation Safety Advisers

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

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Mobile: +64 27 285 2022

Email: Bob.Jelley@caa.govt.nz

Report Safety and Security Concerns

Available office hours (voicemail after hours).

0508 4 SAFETY

(0508 472 338)

isi@caa.govt.nz

For all aviation-related safety and security concerns

Accident Notification

24-hour 7-day toll-free telephone

0508 ACCIDENT

(0508 222 433)

www.caa.govt.nz/report

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

Accident Briefs

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

ZK-HXZ Hughes 369D

Date and Time:	21-May-12 at 14:00
Location:	Lake Sumner
POB:	1
Injuries (Fatal):	1
Damage:	Destroyed
Nature of flight:	Agricultural
Pilot Licence:	Commercial Pilot Licence (Helicopter)
Age:	35 yrs
Flying Hours (Total)	3793
Flying Hours (on Type)	493
Last 90 Days:	103

The helicopter was engaged in spot spraying of weeds around the shores of Lake Sumner. Conditions for spraying were perfect and the lake surface was described as being "very still and mirror-like". The helicopter was last heard and seen by its support crew from about 6 km away across the lake, carrying out a spraying run. The crew continued preparing the next load of spray, when they heard a banging noise. One of the men immediately looked to where he had seen the helicopter a few seconds earlier but did not see anything. The helicopter was reported overdue, and debris from the machine was located in the lake a few hours later.

The CAA investigation concluded that the most probable cause was spatial disorientation resulting in controlled flight into the glass-like lake surface.

A full report is available on the CAA web site.

[CAA Occurrence Ref 12/2242](#)

ZK-HJL Hughes 269C

Date and Time:	14-Nov-13 at 21:00
Location:	Te Kauwhata
POB:	1
Injuries:	0
Damage:	Destroyed
Nature of flight:	Agricultural
Pilot Licence:	Commercial Pilot Licence (Helicopter)
Age:	42 yrs
Flying Hours (Total)	11590
Flying Hours (on Type)	7000
Last 90 Days:	120

During a spray operation in a gully, the helicopter turned into a wire, 20–30 ft agl. The wire broke at the top post and wrapped around the tail rotor, causing the helicopter to descend on to the side of the hill. The pilot was aware of the wire, but believed he was clear when commencing the turn.

[CAA Occurrence Ref 13/5709](#)

ZK-IMZ Robinson R22 Beta

Date and Time:	19-Jan-13 at 20:10
Location:	Nokomai Station
POB:	1
Injuries (Minor):	1
Damage:	Destroyed
Nature of flight:	Private other
Pilot Licence:	Commercial Pilot Licence (Helicopter)
Age:	32 yrs

The pilot was intending to make a 'toes-on' slope landing to pick up a hunter. On approach, a downdraught caused an increased rate of descent that the pilot was unable to arrest. The helicopter struck the ground and rolled several times down the hillside.

The pilot had previously operated turbine-engine helicopters, and did not anticipate the different available power margin when operating a piston-engine helicopter.

[CAA Occurrence Ref 13/177](#)

ZK-HWF Aerospatiale AS 350BA

Date and Time:	16-Oct-13 at 5:40
Location:	Awatere Valley
POB:	1
Injuries:	0
Damage:	Substantial
Nature of flight:	Other aerial work
Pilot Licence:	Commercial Pilot Licence (Helicopter)
Age:	44 yrs
Flying Hours (Total)	388
Flying Hours (on Type)	8
Last 90 Days:	14

After an early-morning startup for a frost protection flight, the pilot found that the demister control appeared to be seized. He used the main cabin heat to demist the windshield before takeoff, but during the 500-metre transit to the operating area, the windshield frosted over. Deprived of external reference, the pilot attempted to operate the heater control again, and while distracted, allowed the helicopter to descend into the vineyard.

The pilot felt a 'knock', and believing it to be only the tail stinger contacting something, continued with the operation. No unusual noise or vibration was evident. After shutdown in daylight, a detailed inspection found damage to the tail rotor blades, the vertical stabiliser, and the tail boom.

Pilot decision making, pilot experience, and supervision were among the issues identified during the investigation.

[CAA Occurrence Ref 13/5217](#)

ZK-ZKZ Zenair Zodiac CH-600

Date and Time:	7-Mar-14 at 08:15
Location:	Hawera
Injuries:	1
Damage:	Substantial
Nature of flight:	Private other
Pilot Licence:	Recreational Pilot Licence (Aeroplane)
Age:	58 yrs

The purpose of the flight was to attend a fly-in, in company with a group of other aircraft. After a discussion among the pilots, it was decided that ZKZ, as the faster aircraft, would be the last to leave.

The pilot began his takeoff once the preceding aircraft was airborne, keeping out to its right because of the calm conditions, and the first turn after takeoff being to the left. After liftoff, the pilot checked airspeed and confirmed a positive rate of climb.

The left wing dropped slightly, which the pilot corrected, but almost immediately the aircraft rolled abruptly over 60 degrees to the left and began descending rapidly. Although the pilot applied full opposite aileron and rudder and managed to level the wings, he was unable to arrest the descent and the aircraft struck the ground heavily. The canopy popped off at impact, and the aircraft slid a considerable distance down the grass runway.

After ascertaining that there was no fuel leaking, the pilot checked that the ELT had not operated, and notified the other aircraft of the accident.

The pilot reported that he did consider wake turbulence before takeoff but did not expect to encounter it from the preceding aircraft in this case. The pilot is experienced in both formation flying and gliding operations, and understands the hazards of wake turbulence. He has recounted his story in the July/August 2014 issue of *Vector* magazine.

[CAA Occurrence Ref 14/923](#)

ZK-WHZ Tecnam P2008

Date and Time:	24-Oct-13 at 8:57
Location:	Hamilton
POB:	1
Injuries:	0
Damage:	Destroyed
Nature of flight:	Training solo

On completion of some dual circuit training, the pilot was to continue the exercise solo. He reported that when he applied full power to take off, the nose wheel came off the ground almost immediately. He believed that if he checked forward at this point, he would strike the ground, so elected to continue.

The aircraft climbed to 150–200 feet before appearing to stall. The right wing dropped, and the aircraft descended, struck the ground heavily, and slid into a parked Cessna 172.

The training organisation has since taken steps to ensure that all instructors further emphasise the characteristics of the aircraft when operating at low all-up weights.

[CAA Occurrence Ref 13/5280](#)

ZK-HTA Bell 206B

Date and Time:	07-Jun-13 at 21:50
Location:	Nelson
POB:	1
Injuries:	0
Damage:	Substantial
Nature of flight:	Ferry/positioning
Pilot Licence:	Commercial Pilot Licence (Helicopter)
Age:	29 yrs
Flying Hours (Total)	2634
Flying Hours (on Type)	444
Last 90 Days:	121

Shortly after takeoff, the engine rpm drooped by a small amount, which the pilot attempted to correct by 'beeping' up. The rpm then reduced suddenly to idle, and although the pilot entered autorotation, the resulting landing was heavy.

Engineering investigation found no leaking air lines, but the power turbine governor was venting as low as 10 psi instead of the normal 22. The FCU was sent to the manufacturers for inspection.

Worn pin holes were discovered in the Pr-Pg housing, which allowed the Pr-Pg lever to move fore and aft when the throttle shaft was moved. This in turn caused variations in Pr-Pg valve leakage, which could explain the engine power loss.

[CAA Occurrence Ref 13/2821](#)

ZK-RRL Cessna 182R

Date and Time:	12-Nov-13 at 12:50
Location:	Whatawhata
POB:	2
Injuries:	0
Damage:	Substantial
Nature of flight:	Private other
Pilot Licence:	Commercial Pilot Licence (Aeroplane)
Age:	25 yrs
Flying Hours (Total)	425
Flying Hours (on Type)	43
Last 90 Days:	45

On approach to a 'one-way' farm airstrip in tailwind conditions, the aircraft encountered windshear and landed heavily short of the strip. The aircraft bounced and struck a mound of earth, causing the nose gear to collapse.

The pilot had operated from farm airstrips numerous times before, although the slope of this one was steeper than any he had used previously.

The pilot now realises that he did not allow himself enough leeway for the unexpected during the approach. He also commented that the slope of the airstrip had led him to believe it was shorter, which is why he was aiming to land as short as possible.

He has since spoken to several A-Category instructors for further advice about this accident and will conduct remedial training before operating into farm strips again.

[CAA Occurrence Ref 13/5674](#)

GA Defects

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

Key to abbreviations:

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

Cessna 172R

Fuel tank drain valve

Part Manufacturer:	SAF-AIR Products INC
Part Number:	SA82
ATA Chapter:	2810

During a pre-flight fuel drain, the fuel flow could not be stopped from the wing fuel drain valve. On removal of the drain valve, it was found to have come apart internally, with the components inside the fuel tank.

The maintenance provider reported that 20 days previously, all 10 drain valves had been replaced with owner-supplied valves manufactured by SAF-AIR Products Inc (Part No. SA82). They had been given a Form One from a Part 19F company. The parts were said to comply with TSO-C76 approval, and were a replacement for Cessna Part No S2020-2.

The internal sealing mechanism was held into the valve body by a small circlip in an internal shallow groove. The upward force required to overcome the spring was enough to push the circlip out of the groove and allow the sealing mechanism to be ejected into the tank.

All drain valves were replaced with standard Cessna items. This course of action was taken due to the possibility of an in-flight failure, resulting in fuel being lost from a valve not visible from the cockpit.

[CAA Occurrence Ref 13/4450](#)

Cessna U206G

Aileron cable

Part Manufacturer:	Cessna
Part Number:	1260078-5
ATA Chapter:	2711
TTIS hours:	7728.7

Excessive wear was found on the top aileron cable between control column pulleys during SIDs inspections.

The cable had been wearing against the cable guard bracket (PN 1250422-1) on the back of the firewall. It appears that the bracket had been deformed slightly, possibly from contact with the wiring loom for the Cessna 300 series radio installation.

The maintenance provider notes that this section of the cable can be seen easily only when the radios are removed.

The FAA was notified by the CAANZ.

[CAA Occurrence Ref 13/5599](#)

Cessna 208B

Fuel control unit

Part Manufacturer:	Honeywell
Part Number:	3244897-4
ATA Chapter:	7320
TSO hours:	1474.2

During a post-inspection ground run, it was found there was no additional throttle lever travel at red-line torque (1865 ft/lb).

Extensive maintenance investigation found movement in the fuel control unit (FCU) body between the main body and the housing where the Py air sense line is located (between the FCU body and the fuel pump). This housing is bolted to the FCU and lockwired at overhaul. There was significant movement evident between the two, and on closer inspection, movement could be seen when the throttle was moved back and forth. A Py leak at this junction was suspected. The FCU was removed and a serviceable unit fitted.

The faulty FCU was sent to an overhaul facility for investigation. It was determined that there was likely to have been an assembly error. Either the securing screws were not torqued sufficiently during FCU assembly, or the screws had loosened through vibration during engine operation. In either case, the lockwire was not tight enough to prevent the screws from backing off. The overhaul facility has put preventative measures in place to prevent a recurrence.

[CAA Occurrence Ref 13/5346](#)

Robinson R66

Landing gear skid

Part Model:	R66
Part Manufacturer:	Robinson Helicopter
Part Number:	C014-11
ATA Chapter:	3270
TTIS hours:	774

The left-hand skid was found broken just aft of the front undercarriage leg. Corrosion was found on the inside of the skid.

The helicopter date of manufacture is recorded as 8/2012, with total time of 774 hours. The helicopter is used extensively on agricultural suspension spraying. The application uses seawater as a carrying medium, and also contains other highly alkaline products. The net result of the helicopter working with the product and resting in it during landing has allowed the suspension to enter the skids at the drain holes.

New skids will be treated internally and powder-coated.

[CAA Occurrence Ref 13/5700](#)

McDonnell Douglas 500N

Main rotor transmission studs

Part Model:	520N
Part Manufacturer:	MD Helicopters
Part Number:	369A2029-3
ATA Chapter:	6330
TTIS hours:	8348

During an unscheduled inspection of the main rotor transmission, cracking was identified on all four of the studs on the transmission side of the stud assembly. Although the exact cause could not be determined, it is believed that the cracks were initiated due to bending damage to the studs on a previous transmission removal. The defective studs were replaced with new serviceable items.

[CAA Occurrence Ref 13/4147](#)

NZ Aerospace FU24

Air intake pipe

ATA Chapter:	7160
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A serious loss of engine power occurred shortly after takeoff. The pilot jettisoned the load and made a successful emergency landing on a flat paddock.

The engineer inspected the aircraft and found that the air intake hose to the fuel control unit had collapsed. The hose was replaced and the aircraft was released to service.

[CAA Occurrence Ref 13/5504](#)

Piper PA-31-350

Avionics relay

Part Model:	MB4D
Part Number:	484-192
ATA Chapter:	2450

On the first start of the day, the pilot reported no #2 avionics power, followed by smell of smoke. Maintenance found #2 avionics relay contacts burned. These relays are an open type of relay with exposed contacts. Modification to replace OEM relays with Mil Spec sealed relays was approved and new relays installed.

[CAA Occurrence Ref 13/3634](#)

Robinson R44 II

Inlet valve

ATA Chapter:	8530
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During cruise, the helicopter yawed suddenly, and the pilot noticed a rise in manifold pressure as well as rotor and engine rpm. Manifold pressure and rpm were controlled by lowering the collective and reducing throttle, with the helicopter able to continue to Milford with significantly reduced power. A zero-speed landing was made onto the helipad, with power being insufficient to hover at sea level.

Engineering investigation determined that an inlet valve had failed. The failed components were sent to the engine manufacturer for further investigation.

[CAA Occurrence Ref 13/5722](#)

Kawasaki BK117 B-2

Torque idler gear nuts

Part Model:	LTS101-750B-1
Part Manufacturer:	Honeywell
Part Number:	MS21043-5
ATA Chapter:	7260

Following a pilot report of an in-flight engine chip warning light, maintenance investigation found metal contamination in the engine oil filter. After the gearbox was removed from the engine, the nuts on the torquemeter idler gear were found to be cracked, and in some cases completely missing from the retention bolts.

The New Zealand Honeywell representative was informed, and he advised that this was a known issue with the LTS101 torquemeter gear assembly, and that Honeywell was currently working on a product improvement.

Subsequently, Honeywell Service Bulletin LTS101-72-60-0211 has been revised (revision 2 released 15 September 2013). The Bulletin calls for the replacement of the previous part number MS21043-5 or 4-081-268-01 nuts with part number 4-081-268-03 nuts at the next gearbox inspection.

The gearbox inspection is carried out at 1800-hour intervals, although operators may wish to consider incorporating this Service Bulletin at an earlier stage, in the interests of improved reliability.

[CAA Occurrence Ref 13/1239](#)

Robinson R22 Beta

Drive belt

Part Model:	R22
Part Manufacturer:	Robinson
Part Number:	A190-2 Rev Z
ATA Chapter:	6300
TSI hours:	1.1
TTIS cycles:	1.1
TTIS hours:	774

The pilot reported that the clutch light was flickering during flight. After landing, one half of the aft drive belt was found to have come off the top sheave, and had delaminated.

During maintenance investigation, the sheave alignment was checked and found at maximum limits due to new engine mounts sagging. The maintenance provider, however, does not think that the sheave alignment contributed to the belt failure, which occurred at 1.1 hours' time in service.

The Robinson Helicopter Company was notified of the belt failure by the CAA, but no response had been received at the time of closing this occurrence.

[CAA Occurrence Ref 13/1681](#)

14:15

14:45



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E)RWY 08/26 CLSD DUE WIP ON NORTHERN RWY EDGE.
AVBL FOR SKED OPS AND APPROVED OPERATORS WITH
2 HOURS PN CONTACT AIRPORT MANAGER
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Check NOTAMs and AIP Supps