

# vector



## Helicopter Over Water

No Engine, No Problem

SMS Certification for  
Chief Executives

Someone Told Me I Could...

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Cover: One of many New Zealand helicopters operating near and over water, the Eurocopter EC120 of South Pacific Helicopters is seen here heading around the Kaikoura Peninsula. Photo courtesy of South Pacific Helicopters.

#### Published by the

Communications and Safety Promotion Unit of the Civil Aviation Authority of New Zealand, PO Box 3555, Wellington 6140.

Tel: +64 4 560 9400,  
Fax: +64 4 569 2024,  
Email: [info@caa.govt.nz](mailto:info@caa.govt.nz).

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

**Manager Communications and Safety Promotion** Mike Richards.

**Editor** Peter Singleton.

#### The Vector Team

Charlie Brimmicombe, Joe Lees,  
Pen Mackay, Bridget Tunnicliffe, Rose Wood.

**Design** Gusto.

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# No Engine, No Problem

Glider pilots love powerless flight for its own sake – but they also say gliding skills make much better powered pilots.

When the glider pilot, Captain Chesley “Sully” Sullenberger, safely guided US Airways Flight 1549 on to New York’s Hudson River in January 2009, he was rightfully lauded for his flying skill.

A flock of Canada geese had taken out both engines of the A320-214, but despite the potentially catastrophic landing, all 155 people on board lived.



Twenty-six years before the so-called ‘Miracle on the Hudson’, was the ‘Gimli Glider’.

An Air Canada Boeing 767 – with engines out due to fuel exhaustion – safely landed at Gimli Industrial Park in Manitoba, Canada. Its captain, Robert Pearson, was also an experienced glider pilot. All 61 people on board survived.

Former Chief Flying Instructor for Gliding Manawatu, Russell Richardson, says those successes should not be that surprising.

“Glider pilots fly in a permanent state of engine failure. Their heightened awareness and their intense focus are borne of the fact they have no engine to get them out of difficulty.”

CAA’s investigator of Aviation Related Concerns, Roger Shepherd, has recently discovered the delights of engineless flight, calling it a “stunning experience”.

But the 4000-plus hour fixed wing pilot says learning to glide has also been highly educational for him as a powered flier.

## Reading the Weather

Roger says that although what’s going on with the weather has always been important to him as a pilot, it’s paramount in gliding.

“We general aviation powered pilots tend to look at the sky in a fairly simplistic way. It’s wet or cloudy or sunny or windy or calm.

“But a glider pilot hones a heightened sense of what’s going on in the atmosphere, piecing together all the bits of met information to come up with a comprehensive picture of what’s happening now, and what’s going to happen soon.”

Roger Read, a 2000-hr glider pilot, and an 18,000+ hr powered pilot, agrees that successful soaring pilots have a profound understanding of the weather in its widest form, as well as of micro climates.

“Glider pilots learn to operate safely and comfortably along a wide spectrum of weather – and terrain – in which many powered pilots would be uncomfortable.

“We have to maximise overall flight performance by making the most of the weather conditions. If we launch to, say, 2000 ft AGL, in still air we would be back on the ground inside 20 minutes. So we try to extend our flight time by soaring in air that is rising faster than we are sinking through it.

“The skill comes in knowing where such rising air is likely to be, when it will be there, how long it will be there, and then how to stay in it and use it efficiently.

“We talk about our ‘soaring engine’. That’s the interaction between the sun, wind and terrain, and its effect on the local air mass.

“Having to understand that gives us a finely tuned awareness of our environment.”

Russell Richardson calls it “flying seamlessly to the conditions”.

“If we don’t know how to use the energy of things like thermal lift and ridge lift,” he says, “it’s more likely to result in an outlanding (landing other than at the usual place) which is a nuisance at best, and potentially dangerous, if you don’t know what you’re doing.”

*Continued over* >>

Roger Shepherd agrees that instead of trying to battle the elements, glider pilots use the ups and downs of air flow.

“Going with thermic and orographic turbulence means the airframe and the pilot are not as fatigued as those under power. It’s also a smoother ride for any passengers.

“The way GA pilots generally try to adhere to a specific or chosen height during cruise is often impractical and possibly dangerous – especially when flying VFR in areas like the mountains of the South Island.

“Gliding allows powered pilots to experience both the unique mountain wave and wind conditions in New Zealand, and the large increases in economy and performance to be had from such flying.”

## Awareness

Roger Read says situational awareness (SA) is not something a pilot should suddenly start to employ when conditions get awkward.

“It will most likely be too late to be of full use. SA is really about constantly thinking ahead.

“For glider pilots, our SA begins on waking up on the morning of a flight, and active lookout starts as we position out on the airfield for a launch.

“Gliders have long wings, and while positioning for a launch, are often manoeuvred near to others. A misjudged positioning turn has the potential to inflict serious damage if wings collide, so everyone involved is alert to that possibility.

“Once in flight, SA is not only about attention to the conditions and the energy in the environment, it’s also about monitoring our own wellbeing.

“Our cockpit is a confined space and not always ergonomically friendly, particularly when it comes to those long flights, which can be up to 13 hours, and are frequently up to five hours.

“A lack of food or water, heat or cold stress, or hypoxia are all capable of undermining our performance.

“We have to keep checking how we’re feeling, because we must be well placed to make sound judgements and decisions.”

While all pilots know it’s ‘Flying 101’ to continually check for suitable landing areas, glider pilots actually do it. They say outlandings are part of the scene for them and normally no big deal. They believe they learn more about field selection than GA pilots generally do.

Roger Shepherd says a bit of gliding would improve that practice in power pilots.

“It’s a great safety habit,” he says.

## See. Avoid.

“Once airborne,” says Roger Read, “the very nature of seeking out the rising air draws us into close proximity with other gliders seeking the same lift.

“Depending on the type of lift – thermal, ridge, mountain wave, air mass convergence – the glider pilot will often be operating very close to other gliders.”



Russell Richardson agrees, saying it's a lifesaving skill to be constantly on the lookout.

"Apart from all those gliders heading for the same lift, there are the additional hazards of operating close to uneven terrain, near cloud, or a combination of both."

Roger Read says the design and colour of gliders make them difficult to spot at times, even for other gliding pilots.

"Long wings, small frontal cross section, lack of lights, absence of contrasting markings and paint schemes – gliders are typically white to ensure heat stability of the FRP materials they are made of – and it makes seeing other gliders that little bit harder.

"And of course, they're silent. So, as with everything else in gliding, we have to be extra-vigilant as to where other aircraft might be."

## Pilot versus Machine

Roger Shepherd says a glider pilot flies according to their senses, rather than according to instruments.

"The focus of a glider pilot is outside the cockpit. The attention of the powered pilot is probably inside – probably far more than is advisable – because the lure of the instrumentation is so great."

Roger Read says traditional flight instruments are of little use to the glider pilot.

"The slip ball is replaced by the very accurate piece of string taped to the outside of the canopy where it senses and

indicates any slip or skid. The variable speed indicator is replaced with a more sensitive instrument called a variometer that also filters out changes in climb or descent rates, due solely to airspeed fluctuations.

"The 'Mark 1 Eyeball' is used to judge height and direction, as unlike in a high proportion of powered flight time, both are rarely held constant."

Roger Read says that 'lookout' is the highest priority from day one in a glider pilot's training.

"They learn to fly smoothly and accurately while looking outside the cockpit to ensure the airspace they are flying towards is clear.

"They fly by attitude, the sound of the glider and the feel of the controls.

"Sure, we have instruments, often including some very sophisticated GPS-based navigation and performance computers, but they are usually augmented with audio tones allowing the pilot to monitor the information they're providing, without requiring significant and potentially hazardous time, head-down.

"And yes, we also have our own version of TCAS called FLARM that augments our visual lookout.

"But one key difference, put simply, is that a power pilot looks inside to see what the engine that keeps them airborne is doing, whereas a glider pilot looks outside to see what the 'engine' that keeps them airborne is doing."

*Continued over >>*



Powered powerless flight: an ASH25M two seat, high performance, self-launcher.

» Continued from previous page

## What a Power Pilot Can Do

Many old hands are increasingly expressing anxiety that manual flying skills are taking a back seat in the modern cockpit.

The safety officer for UK-based easyJet, is a former world gliding champion.

Sarah Kelman says gliding has helped her skills as an Airbus captain, particularly with situational awareness, and with her ability and confidence in recovering from non-normal situations.

To illustrate, she told a Royal Aeronautical Society conference in 2013, the 'unusual attitudes' about which a commercial pilot may be very anxious, are business-as-usual for the glider pilot.

She maintains that teaching gliding skills to airline pilots would go some way to arresting the erosion of manual flying skills.

Roger Shepherd agrees that powered pilots – at any level – could do worse than get some gliding experience.

He says the best value his powered brethren could get from a few hours gliding would be a few sorties of ridge soaring, or very low level thermalling.

"It's a chance to get the mind thinking about visualising where the horizon is when down below a ridgeline, judging about turn radius, the room to manoeuvre, and not being afraid of the angle of the bank. Gliding is all about rudder-aileron coordination."

Russell Richardson says gliding puts a different perspective on things.

"It's changed my view, for instance, on powered aircraft involved in a forced landing.

"It's shown me that a Cessna or Piper can be landed just as safely without an engine. If you know what you're doing."

## Ninety-One Seconds

That's how long it took a glider pilot to safely land his powered aircraft after "the engine went bang" during an Auckland to Raglan flight.

Read Jill McCaw's description of what happened in "Grateful for Gliding" on page 52 of *KiwiFlyer* (Issue 51, 2017 #2), downloadable from [www.kiwiflyer.co.nz](http://www.kiwiflyer.co.nz). ■

Modern gliders can have very sophisticated onboard computers, but a good glider pilot keeps using the Mark 1 Eyeball.

Image courtesy of Milan Kmetovics, Glide Omarama.



## Get it Right this Summer

Pilots like to blow away the cobwebs over the warmer months when aviation events really start humming, so it's more important than ever to follow the basics.

The sky is typically more congested over summer, and aerodromes can become a hive of activity.

You're more likely to fly further afield, venturing into unfamiliar territory.

So the message is simple: Check NOTAMs and AIP Supplements before you take off.

How else will you know about a big hole in the surface of a runway, or that a flying competition is in progress?

Supps are issued to advise pilots of temporary restricted areas associated with events such as airshows and competitions, including those featuring model aircraft. Temporary airspace associated with an emergency will be promulgated by NOTAM.

Yet there are often reports of incursions into temporary restricted areas, or of aerodrome operators having issues with pilots landing on runways that have work in progress.

The CAA's Aeronautical Services Officer, Paula Moore, says consulting NOTAMs and AIP Supps is an essential part of a preflight briefing.

In addition, Paula says pilots should update their knowledge en route. So check with FISCOM that a new NOTAM has not been issued since becoming airborne.

## School's in Session

Every summer a small number of aircraft bust right through the Matamata temporary control zone.

Aircraft come along unaware that the Walsh Memorial Flying School is in session, or that a control zone exists there.

There have been times when aircraft have joined the circuit on the wrong frequency or for a runway other than the one being used.

This can be avoided by consulting NOTAMs and AIP Supplements, see the information on "Summer Traffic Busy Spots" on the back of this issue of *Vector*.

Email [info@caa.govt.nz](mailto:info@caa.govt.nz) for a free copy of our NOTAMs and AIP Supps poster. It comes in both A4 and A2 sizes. ■

# Too Low, No Go

What do blasting, drones, and rockets have in common? If you fly below minimum height, you might just find out.

**T**he sky isn't the only limit when flying. Every VFR flight is bound by basic minimum height rules.

A minimum height of 500 feet above the surface must be observed, with some exceptions – the most obvious ones being takeoff and landing, or emergency situations.

Picture a circle on the ground directly below the aircraft, extending out 150 metres in all directions. The aircraft must be 500 feet above any obstacle, person, vehicle, vessel, or structure within that circle.

About to fly over a 100 feet tall hill or crane? Make sure you're going to be 500 feet above it.

Extend the circle out to 600 metres in all directions and the aircraft must be 1000 feet above any congested areas like a city, town, or settlement that falls within it.

CAA Aeronautical Services Officer, Paula Moore, says the definition of a settlement could surprise.

"A prison could contain more than 1000 people, and should itself be considered a settlement," she says.

Aircraft are also required to fly at an altitude that would allow an emergency landing without hazard to persons or property.

Having said all that, there are of course exceptions to the rules.

Legitimate activities like aerial photography or topdressing may require an aircraft to fly below the minimum.

This can be done when there is no hazard to persons or property, and when there are only people essential to the operation on board.

## Low Flying Zones

Low flying zones (LFZs) are areas designated for pilot training in manoeuvres below 500 feet.

Use of an LFZ is restricted to those who have been authorized by the holder of a flight instructor rating, and have been briefed by the 'using agency' on operating procedures for the LFZ.

Aircraft should maintain at least 500 feet AGL until they cross the LFZ boundary. Likewise, when vacating, aircraft should be at least 500 feet AGL before crossing the boundary.

## The Dangers

A lot of dangerous activity takes place below 400 feet. If it's happening more than four kilometres from an aerodrome, there's every chance that pilots won't know about it.

"Projectiles from debris blasting could go up to 400 feet without notification. Weapons or pyrotechnics, too, can go up to 400 feet," says Paula.

Balloons and kites can also go higher than you might think. Kite fishing in coastal areas, for example, can see Kontiki rigs climbing to surprising heights.

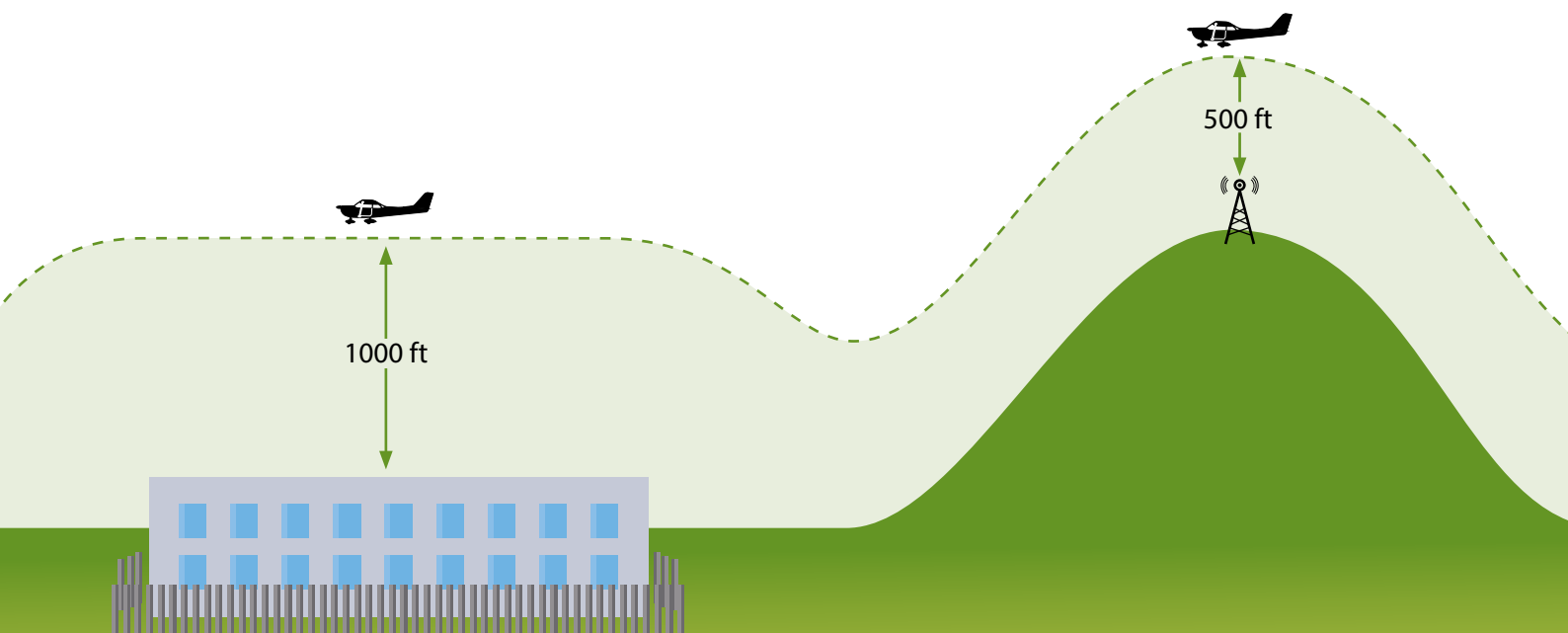
The massive increase in the use of RPAS – or drones – at low level is also something that every pilot needs to be aware of and avoid.

Minimum height rules are more than just the letter of the law. They're an essential safety tool, ensuring separation from a wide and ever-increasing range of hazards.

## More Information

The minimum acceptable heights are prescribed in Civil Aviation Rule 91.311 *Minimum heights for VFR flight*, while low flying zones are detailed in Civil Aviation Rule 91.131.

For a list of LFZs and using agency contact details, refer to *AIP New Zealand* ENR 5.3 Other Hazardous Airspace. ■



# The Value of Safety

Your solid flying skills won't necessarily keep your pilot employees safe and your business aloft.

The longer he spends in the game, the more John Sinclair – the former president of the Aviation Industry Association – realises profitability and safety are “absolutely” linked.

Writing in the August 2016 issue of the Helicopter Association newsletter, John said that while “everyone wants a safe operation, not everybody can afford one”.

“Safety costs real cash,” John said. “And many operators scrimp on it.”

Grant Twaddle, in a life before he became a CAA helicopter operations inspector, managed mortgage investments for a large company.

“An operation *must* be on sound financial ground,” he says. “It’s great to turn a passion into a dream job. But if you’re lying awake at night because your maintenance programme consists of praying the aircraft’s severely balding tyre doesn’t hit a stone on its next landing, your dream job will have become a nightmare.”

“As any operator who’s been in business for a couple of years can tell you, there are myriad unexpected costs – a cylinder failure, prolonged bad weather, or a radio falling over, for instance. There are costs outside your operational control, such as the Global Financial Crisis which reduced tourism. And there are the regular costs, such as maintenance and insurance.

“But if there isn’t enough money to pay for these costs, it’s often safety measures that go first, and that can be, quite literally, deathly to an aviation business.”

Some operators, faced with a shortage of cash, will unwittingly compromise safety by not spending money where they should.

“An operator may have been held up through two weeks of windy conditions to get work done,” says John Sinclair. “A front goes through, things become calm, but now there’s a frost. So in addition to the operator’s backlog of work, they also need to get frost protection work done.”

“But instead of employing a casual pilot to do the frost protection work, the operator makes their pilots work half the

night on that, and then sends many of them off to work on the backlog during the day.

“Or an operator under-records flight time to save on maintenance costs, or they overload their aircraft. Or both.”

Is any of this sounding familiar?

*Vector* spoke to some specialists for advice on how to keep an operation in the black, and flying safely.

## Buying Help

Dedication, passion, and flying skill does not guarantee business success.

Gregg Brimmicombe, an experienced financial officer for a number of aviation companies, says an operator needs to clearly understand the relationship between cash, profits, expenses, and revenues.

“You need to plan, and to create realistic financial forecasts.”

And that takes some financial smarts.

“If your forte is flying, not finances,” says Grant Twaddle, “buy in the skills you need.”

“Hire someone who can produce a simple spreadsheet giving you a breakeven figure. That’s dollars per hour charged to





cover expenses, including those associated with safety measures, over a given period. A good bookkeeper should be able to do it."

## Planning and Budgeting

Grant says that while some businesses create a realistic monthly budget, it can be too short term to rely on, solely.

"They don't look at how their month by month financial decisions affect their yearly economic performance. It runs the risk of missing those big annual expenses."

The specialists recommend starting with a realistic, overarching business plan setting out your overall goals. A good plan should create the pathway to an achievable budget, and the ability to predict cash flow well into the future.

"Your planning should comprise a master plan (where are we going?); organisational plan (how do we get organised?); marketing plan (customers, products, and services); and a finance plan," says Gregg Brimmicombe.

"Ideally, budgets should be prepared after consulting all staff as to what they need to function effectively and safely. A budget should not be imposed arbitrarily on staff by top management."

Gregg says cash is king: there are always expenses associated with short term projects, purchases, and wages.

"But if cash is getting short," says Grant Twaddle, "review your monthly budget to see if there's any way you can further increase your revenues or reduce expenses. Identify where the unders and overs are, and then amend the budget to get back on track."

## Cash Flow Management

Unfortunately, some struggling operations try to improve their cash flow by quoting cheaply, or 'buying work'.

John Sinclair says sector risk profiles have found low pricing by competing operators is a key pressure on aviation safety.

"For instance, the Part 135 Sector Risk Profile identified that when one operator in an area offers cheap services to try to shore up a failing cash flow, all the operators in that area are affected. It becomes a race to the bottom."

Apart from the damage done to safety across such a group of operators, buying work does not equal financial success for the operator concerned.

"We're very aware of industry focussing on cash flow at the expense of profitability," says Grant Twaddle.

"Let's say a rotary operator has an insurance bill of \$20,000 they need to pay within the month. To get the work to pay for that, they might charge \$500 an hour so it will take 20 hours to pay the bill. But let's say it costs \$1000 an hour to run the machine. That's \$20,000 of bills that will eventually need to be paid. It would have been more profitable to keep the machine on the ground."

If an operation gets into financial strife, it's important for the operator to be constantly reviewing the company's financials.

"When we found ourselves in a tight position," says Gregg Brimmicombe, "we prepared three-monthly cash flow projections that we updated each month. We also prepared weekly profit and loss statements, which, while not always 100 per cent accurate, were still close enough to identify any potential problems."

Yunus Musa, from TFS Chartered Accountants, explains that cash flow management is especially important, ironically, during a period of growth.

"As a business grows, more cash is needed for capital requirements, and perhaps to pay the wages of additional staff. But the gap between such immediate expenses and delayed income from sales can put a severe strain on a business's cash flow."

In the end, says John Sinclair, short term measures such as undercutting the competition, are unsustainable.

"It may pay the most immediate bill, but it will create financial and safety risks further down the track, such as underpaid employees, fatigued pilots, and time-expired components.

"People need to be real about their ability to own and manage an operation. And if, in their honest and brutal assessment, they're starting to put themselves and their pilots at risk, it may be time to get out." ■



# SMS Certification for Chief Executives

Some companies become certificated in Safety Management Systems with seemingly little trouble. What do the CEs of those companies have in common?

**A** robust safety management system should flow through an entire operation in a positive way, influencing the safety-linked behaviour and values of each employee.

But it is the attitude of just one person – the chief executive – who largely drives whether the actual *process* of becoming SMS certificated is filled with hooks and hiccups, or is smooth and straightforward.

And it's apparent to the CAA that the companies which have become SMS certificated on their first attempt have chief executives who share a similar approach.

"They're already trying to build as strong a safety culture as possible," says Adrian Duncan, a CAA safety management systems technical specialist. "They have this goal of their business operating smoothly and safely, and their bottom line untroubled by the potential expense of having to deal with an accident.

"Then, before they do anything else, they've come to a thorough understanding of what SMS is all about. They've read AC100-1, researched credible sources on the internet, and consulted other operators. They've checked out the CAA's sector risk profiles, and they've attended a CAA safety management system workshop.

"None of this stuff is rocket science. They've taken the time to learn the fundamentals, and they've led the organisation through the introduction of their SMS.

"In learning those basics," Adrian says, "the CEs have realised that SMS is not just Quality Assurance. Nor is it occupational health and safety at the exclusion of operational safety. Organisations that typically fail in SMS have put all their energy into ensuring their workplace is safe, but haven't given due consideration to the management of their operational risks, which is the primary purpose of an SMS.

"And a safety management system is not just documentation either. The key word here is 'system'. There are 13 elements to an SMS, and 'the manual' is just one of those. Those CEs recognised that 'producing a manual' on its own and submitting it to the CAA wouldn't make much of a difference to safety, and therefore wouldn't be enough to meet SMS certification requirements."

British safety management systems specialist, Neil Richardson, who led a Wellington

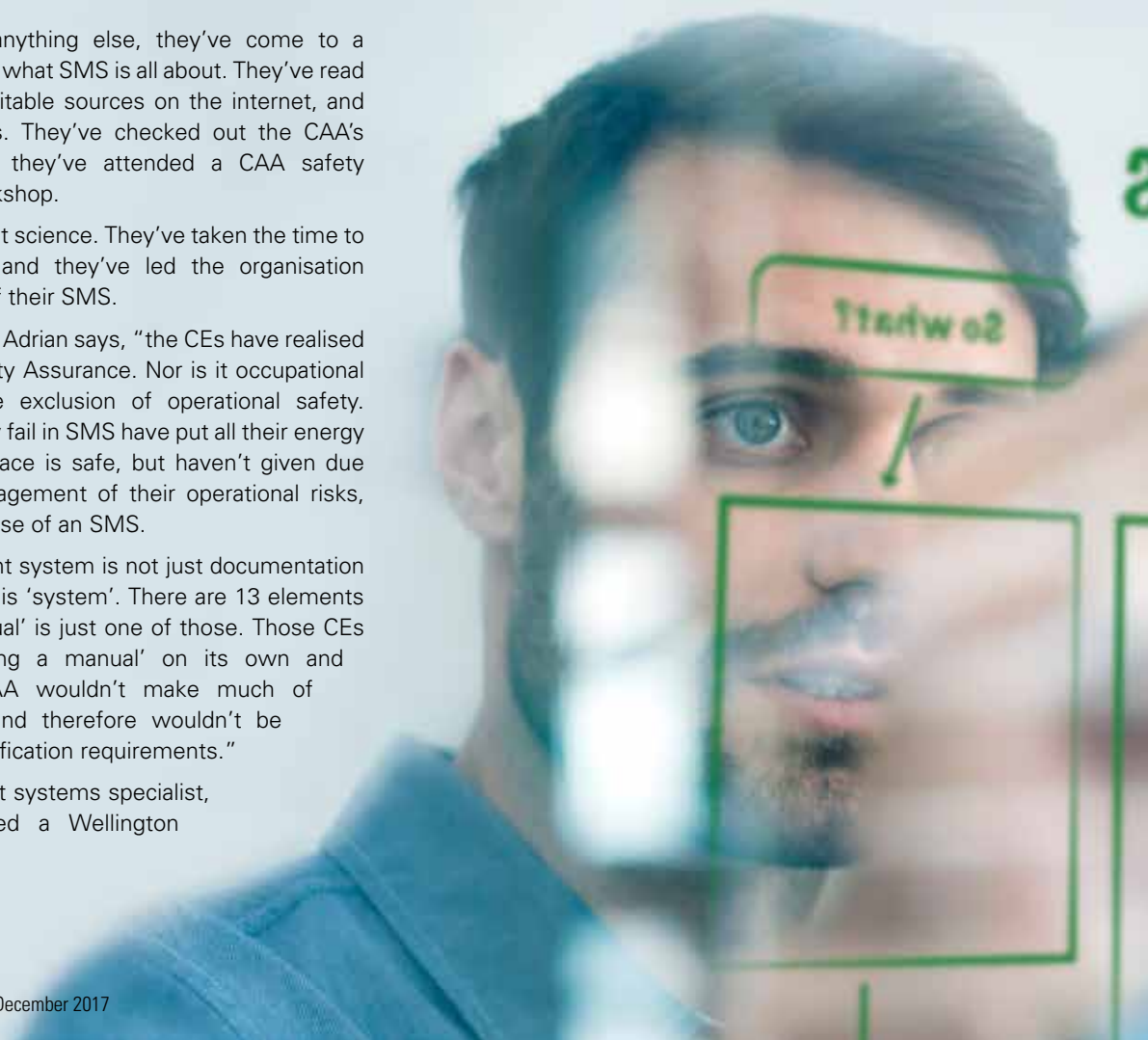
workshop for CEOs in April 2017, agrees SMS is more than just paperwork.

"The reality of 'doing safety' must extend beyond the manual, matrices and risk registers, and play out in the decision making and behaviour of people throughout the organisation on an hour-by-hour basis.

"Safety is fundamentally behavioural."

Only when those CEs fully understood what SMS was, why it's a requirement of ICAO, and what it meant for their business, in both obligations and benefits, did they begin to put something concrete in place.

"That first task," says Don McCracken, CEO of Oceania Aviation, "is to appoint a good safety officer who understands what SMS is, what it entails, and why it's beneficial to the organisation.



"Then the leadership needs to support the safety manager's decisions as they put risk reduction systems in place, and provide them with the resources to do that."

Adrian Duncan says that the CAA has no problem with chief executives getting in external consultants to assist in the design of an organisation's SMS. But, he says, some of those organisations fail in their first attempt to become SMS certificated, because the consultant has used almost a generic 'template', which proves to be a poor fit for that particular operation.

"CEs who've hired a consultant and said to them 'build me an SMS, don't take up my time with it, just get it done and into the CAA' were disappointed when their application invariably failed.

"The chief executives who got the most out of their consultant's fees worked closely with that person to make sure that what they came up with made sense to the CE, and would work well for their operation. This is the concept of 'scalability', where the system corresponds to the size of the organisation, the nature and complexity of the activities the organisation undertakes, and the hazards and associated risks inherent to those activities."

Neil Richardson agrees that each SMS should be tailored for individual operations.

"Keep it pragmatic," he says. "Make it work for you."

A constant refrain from those who've become certificated is that preparing for SMS implementation is more straightforward than it first looks.

Don McCracken admits that the hardest part was "slowly coming to the realisation of how simple it could be".

"Some people with practical intelligence might regard the SMS concept as obscure and difficult to put into place. But in fact, they are already practising safe behaviour to a high level every day. SMS is really just about formalising that practice."

Neil Richardson agrees about keeping it simple.

"SMS can be surrounded by mystery and clouded by jargon, but once you grasp its intent of reducing and controlling safety risks, it makes perfect sense."

But what does all that mean in a practical sense?

"Tool box meetings," says Don McCracken. "Daily updates on projects can identify opportunities for improvement and possible future risk.

"Everyone should be involved in reviewing existing known hazards, identifying new ones, and trying to imagine the future to determine what may be up ahead.

"Writing down any possible outcomes, preparing for the unknown event, creating a Plan B, and mitigating what can be mitigated."

That sort of commitment by every employee is led and modelled by the chief executive, not just to achieve certification, but also because there are benefits to SMS other than those surrounding safety.

"It gives CEs a really clear understanding of the way their business works," says Adrian, "and where the holes are. Weaknesses that maybe, weren't obvious before SMS, suddenly became apparent, and can then be addressed."

"Creating and sustaining the sort of culture that makes SMS part of daily business takes leadership," says Neil Richardson.

"But if fully embraced, the wider business benefits of 'being safe' can be realised through improved harm protection.

"Who wouldn't want that?"

The Director of Civil Aviation, Graeme Harris, regards the introduction of SMS as a potential solution to the very poor safety performance, in international terms, of elements of commercial general aviation in New Zealand.

"For many years, the prescriptive civil aviation safety regulatory system applied around the world has lagged behind the more demanding performance-based approach taken in the occupational health and safety field in many countries.

*Continued over >>*



"The ICAO mandate for the introduction of SMS recognises the need for a significant improvement in safety performance.

"That means a move from minimum standards in the form of civil aviation rules, to what is close to a 'best practice' standard required to manage risks to an 'all reasonably practicable steps' standard."

Graeme notes that assessing what is 'reasonably practicable' must be done in the context of international practice – not simply what is done in New Zealand.

"I see safety management systems as offering the opportunity to improve GA's relatively poor safety performance. I encourage operators to engage early with the CAA during the SMS certification process and to take every opportunity to learn from their colleagues who are already certificated.

"Those colleagues will be able to provide valuable advice on how best to develop the robust risk reduction strategies needed for SMS certification."

## Some Tips

'Group 2' participants should be working on and submitting their implementation plans now. The cut-off date for getting those plans into the CAA is 30 July 2018.

There's a wealth of information on the internet, and particularly on the Skybrary – Safety Management International Collaboration Group – site, which puts out plenty of readable material, good for organisations of all sizes.

Check out the Sector Risk Profile of Parts 135 and 137 at [www.caa.govt.nz](http://www.caa.govt.nz), "Aviation Info > Safety Info > Safety Reports". Compare what the profile says about risk with what your organisation is already doing about that risk.

If you decide to get in a consultant, ask around first. Who did other, successfully certificated, organisations use?

The CAA web site has a range of resources to help with SMS implementation. Go to [www.caa.govt.nz/sms](http://www.caa.govt.nz/sms).

There's also good material at [www.zeroharm.org.nz/](http://www.zeroharm.org.nz/) and at [www.deloitte.com/nz/healthandsafety/](http://www.deloitte.com/nz/healthandsafety/).

If you want to email the CAA's SMS team, it's [sms@caa.govt.nz](mailto:sms@caa.govt.nz).

Applications need to be with the CAA no later than 60 days **prior** to the organisation's implementation date (refer AC100-1). The application needs to include:

- » An appropriate certificate-type application form, eg, 24119/01, 24137/01
- » Amended exposition/SMS manual and associated matrices
- » Completed form 24100/02 Evaluation Tool
- » Senior Person FPP application(s).

Part of assessing whether an organisation has sufficiently robust risk reduction strategies to become SMS certificated includes an onsite visit by the CAA. That includes an interview with the nominated safety manager, the chief executive, and discussions with staff at all levels.

The CAA team will test that the 'elements' of the SMS are in place and are suitable for the organisation, but what's also important are discussions with people throughout the organisation. The team will be testing their understanding of that organisation's SMS, and their involvement in it. It's finding out about the culture and the leadership, and the buy-in of every employee. ■

# Making the Most of Instructing

Getting the most out of instructing – whether it’s adding value to a lesson or maximising your own personal enjoyment – was a strong message from this year’s Flight Instructor Seminar.

The CAA’s biennial seminars are open to any type of instructor, and were held in Ashburton, Hamilton, and Wellington.

CAA Aviation Examiner, Marc Brogan, says the participants were varied.

“There were attendees from the Part 61 and Part 141 training environments, both helicopter and fixed wing. We also had microlight, and balloon instructors – we even had a CEO.”

Marc gave an update on the dual flight training review and made a presentation on ‘Your role as a flight instructor’.

It was during this presentation that Marc got participants thinking about instruction as a profession in its own right.

“The thing with instructing is sometimes people treat it as a pathway on to other things like airlines, which is fine. But I wanted to emphasise that it has merits in its own right. It should be enjoyed while you’re there, rather than thinking about the next step. And it’s a good environment to learn how to be a better pilot.

“That actually came out of a conversation I had with Richie McCaw, when he said that sometimes he was so goal-oriented in his rugby career that he forgot to enjoy himself on the way.”

The former All Black captain spoke at the seminars, and was an attendee on one.

Richie reinforced the message that instruction should be enjoyed.

He also talked about leadership and performance.

“The example he used,” says Marc, “was ‘what is an acceptable level of high performance?’ Would you go to a surgeon if he or she was having a six out of 10 day? Probably not, so why should a six out of 10 instructor be suitable?”

Shannon Mickleburgh, a flight instructor from Massey University, says one session that really stuck with him was ‘how to make the most of a lesson’, taken by CAA Principal Aviation Examiner, David Harrison.

Two of his key messages were that people don’t learn as much if they’re not enjoying themselves, and that instructors should add value to lessons to make them more meaningful.

“That was really interesting from a flight instructor’s perspective, to make more use of the hour-long flight you have with a student,” says Shannon.

“I actually went home and revisited some of my lesson plans and tried to incorporate that advice. At Massey, we already do scenario-based training, so we’re thinking about the whole package. We talk about things like what we’re going to do, and how we’re going to get out there. David had some great ideas for adding little scenarios within the entire flight itself.”

One of the other things David talked about was that it’s not ‘cheating’ to employ good airmanship in terms of where you fly, etc, while you’re training, or during a flight test.

“It’s okay, for example, to do manoeuvres close to a field, to always have a field in sight – it’s not cheating to do that. Or using what’s available to you in terms of avionics and things,” says Shannon.

Squadron Leader Brett Clayton, who’s in charge of the Central Flying School at the Royal New Zealand Air Force, says the seminar was great for networking.

“At the end of the day we all share the common goal of staying safe in aviation and we’re often subjected to the same considerations and pressures. It was a neat reminder that ‘hey, we’re not actually alone’.”

You can see Flight Instructor seminar presentations at [www.caa.govt.nz](http://www.caa.govt.nz), “Quick Links > Seminars and Courses”. ■



# Helicopter Over Water

As tourism increases, so do helicopter flights over water. Can more be done to protect passengers and crew?

**A**ny time a helicopter operates beyond autorotational distance from shore, the risk of ditching in water needs to be given particular consideration.

If there's just no opportunity to divert around that lake, or if your route takes you off the coast, you must take all practicable steps to manage the extra risks involved.

Health and safety legislation requires it, passengers expect it, and operators should demand it of themselves.

## When It Goes Wrong

A couple of locals have arrived for a lunchtime flight to the island. You've done this a thousand times, but it's still a pleasure. The scenery is worth it, and the sun has turned out.

You sneak a bun from the picnic hamper and make final preparations while the passengers are briefed.

They're told how to approach the helicopter, what to do during flight, and how to operate the door in an emergency situation.

It's only a quick trip across water, but the rules require life jackets to be carried. They can be hard to find and fit in a panic, so you've made sure everybody is wearing theirs.

If the worst should happen, you know you'll all be kept afloat long enough for the local rescue service to pick you up.

Nothing seems unusual about the flight until you notice a subtle tapping noise. Seconds later, without warning, the engine dies and you're heading for the drink.

Your training kicks in and you autorotate to a perfect landing, but without airframe flotation, you know it's going to get messy.

The helicopter rolls over and fills with water in seconds. Amid the chaos and disorientation, you somehow manage to get yourself unbuckled and out the door. The passengers, thankfully, also find their way out and inflate their life jackets.

You hadn't left yourself enough of a height buffer to allow time to activate the ELT. You can only hope it went off automatically.

You're too far offshore to swim anywhere, and the cold coastal water is leaving you breathless. Your muscles start to cramp as you huddle with the passengers.

The wait begins.

## Into the Cold

Many people assume that the worst part of ditching in water will be the impact. Survive that, and life jackets will keep everybody safe until help arrives. Right?

If a passenger or pilot isn't already wearing their life jacket, it may be impossible for them to find and fit one during a ditching.

Wearing a life jacket alone also does nothing to reduce the effect of cold water on the human body, particularly when help could be some time away.

The initial effects of 'cold shock' can last for several minutes and leave a person uncontrollably gasping for air. This greatly increases their chance of taking in water and drowning.

Their rapid breathing also flushes carbon dioxide out of the body, causing muscle cramps. Blood pressure increases, bringing with it a greater risk of heart failure and brain haemorrhage.

Hypothermia is by far the biggest killer in water survival situations.

Professor Michael Tipton, author of *Essentials of Sea Survival*, conducted an experiment at the British Institute of Naval Medicine; placing competitive swimmers in a ten degree Celsius pool.

Olympic gold medallist Duncan Goodhew was submerged for just eleven seconds. Despite the brief exposure, he went into cold shock, and gasped uncontrollably after surfacing.

The other participant, Commonwealth Games gold medallist Sharron Davies, wasn't subjected to full immersion but could swim for only 10 minutes in the cold water before starting to lose control.

## HUET Training

Helicopter Underwater Escape Training (HUET) teaches people how to escape a helicopter following a water ditching.

Knowing what to do reduces the chance of panic during the real event. It reduces the chance of confusion and disorientation.

Daniel Stevenson, from Kaikoura-based South Pacific Helicopters, has chosen to go beyond minimum compliance levels and all his pilots have completed HUET courses.

"It's a workplace, so risk must be mitigated for staff. You have to do the best for them, and for the travelling public," he says.

"HUET courses are valuable because passengers may depend on you if you ditch in the ocean. You could be the only one there to drag them out of the aircraft."

Pilots with HUET training often find they can give passengers a better briefing, having been through a simulated ditching.

Briefings can, for example, include asking passengers to close their eyes and find the door handle. They should also be told the importance of removing a headset before a ditching, because, in a panic, the cord can easily get tangled.



## Life Rafts

One person with first-hand experience of a water ditching is CAA Flight Operations Inspector, Richard Martin.

During the mid-90s, he was involved in a helicopter ditching, while operating off a ship in the Pacific. The engine failed climbing through 800 feet to cruise.

“One of the most compelling arguments for carrying life rafts in New Zealand is that they allow people to get out of the cold water.”

“To do the best for passengers, life rafts should be a minimum if the aircraft doesn’t have flotation,” he says.

“A life jacket isn’t going to keep people warm. A raft keeps their body out of the water, and offers greater visibility. They are much easier for rescuers to find than a few heads bobbing up and down.”

As with any equipment in an aircraft, it’s important that life rafts are inspected and maintained to the standards set by their manufacturer.

## Flotation

The use of airframe flotation devices can offer an even greater chance of survival.

When Richard’s helicopter came down, he was fortunate in two ways.

“Trying to land on glassy water is extremely difficult, but we had enough of a breeze that day,” he said.

His helicopter also had floats, leaving both Richard and his passenger dry and comfortable while they waited for rescue.

Daniel Stevenson equips his EC120 and Jet Ranger with pop-out floats, life rafts and PLBs for offshore work.

“You have to give yourself as much chance as you can in a hostile environment.

“The costs could be seen as prohibitive by some operators,” he says, “but at the end of the day, what’s the cost of ditching into water and losing lives?”

## More Information

Email [info@caa.govt.nz](mailto:info@caa.govt.nz) for a free copy of the *Survival GAP* booklet, or view it online at [www.caa.govt.nz](http://www.caa.govt.nz), “Quick Links > Publications > *Good Aviation Practice* booklets.”

Also see the recent NTSB Safety Alert on flight helmet cords at [www.ntsbt.gov/air](http://www.ntsbt.gov/air). ■

# Secure Loads – Everyone's

When was the last time you had a chat to your ground handlers about the centre of gravity?

**F**or CAA Air Transport Inspector, Tom van Rooyen, the danger posed by insecure loads is personal.

The 16,000 hrs-plus Boeing 777 captain was, in June 2015, taxiing for takeoff at Tambo International Airport in Johannesburg, on a regular Monday run to Dubai, when the cabin crew called the flight deck.

"They said there was a strange noise in the belly of the aircraft. When I asked them what it sounded like, their reply sent shivers down my spine. 'It's a rumbling sound, like someone rolling an empty 44-gallon drum around.'

"With images dancing through my head of a recent 747 fireball due to moving cargo, I immediately returned to the gate. And yes, it was found that some cargo containers had come loose and were moving around the hold.

"Who knows what would have happened if the attendants had not said anything?"

Since 2010, in New Zealand there have been 99 instances of wrongly loaded cargo, shifted cargo, or cargo not secure. The occurrences have come from across the spectrum of aviation activity.

The good news is that, increasingly, the instances have been discovered before pushback. But, even taking into account that the cargo transport sector is growing, the not so good news is that of those 99 instances, 51 have occurred in the last two years.

"These types of occurrences," says Tom, "could have a potentially catastrophic outcome. Making sure cargo, cargo containers, and luggage are stowed properly is everyone's responsibility.

"Quite simply, it's 'eyes open'.

"The mechanics and engineers circling the aircraft as it's being readied for flight can pick up on something that doesn't look quite right.

"And vigilant cabin crew willing to speak up, as they were on the flight I described, may prevent a tragedy, or at the very least, an intensely stressful situation."

But of course, the baggage or 'ramp' handlers are the first line of defence against incorrect stowing practices.

"But how much do they know about the importance of what they do?" questions Tom.

"If they don't know much, and they feel that what they do is not very high on the safety scale, and they're rushing to load an aircraft that must be away at a certain time, or the weather is bad, they may not work with the care needed to avoid a disaster."

Tom says it is a natural part of safety management systems for everybody in an operation to have what he calls a "healthy culture of suspicion".

"If something doesn't look right, ask questions. And don't stop asking questions until you are satisfied."

One of the most shocking examples of what can happen if not enough questions are asked, is that of Flight NCR102.

In April 2013, the National Airlines cargo aircraft took off from Bagram Air Base in Afghanistan, heading for Dubai. After becoming airborne, the aircraft pitched up until it appeared to stall, then rapidly descended, striking the ground and killing all seven on board.

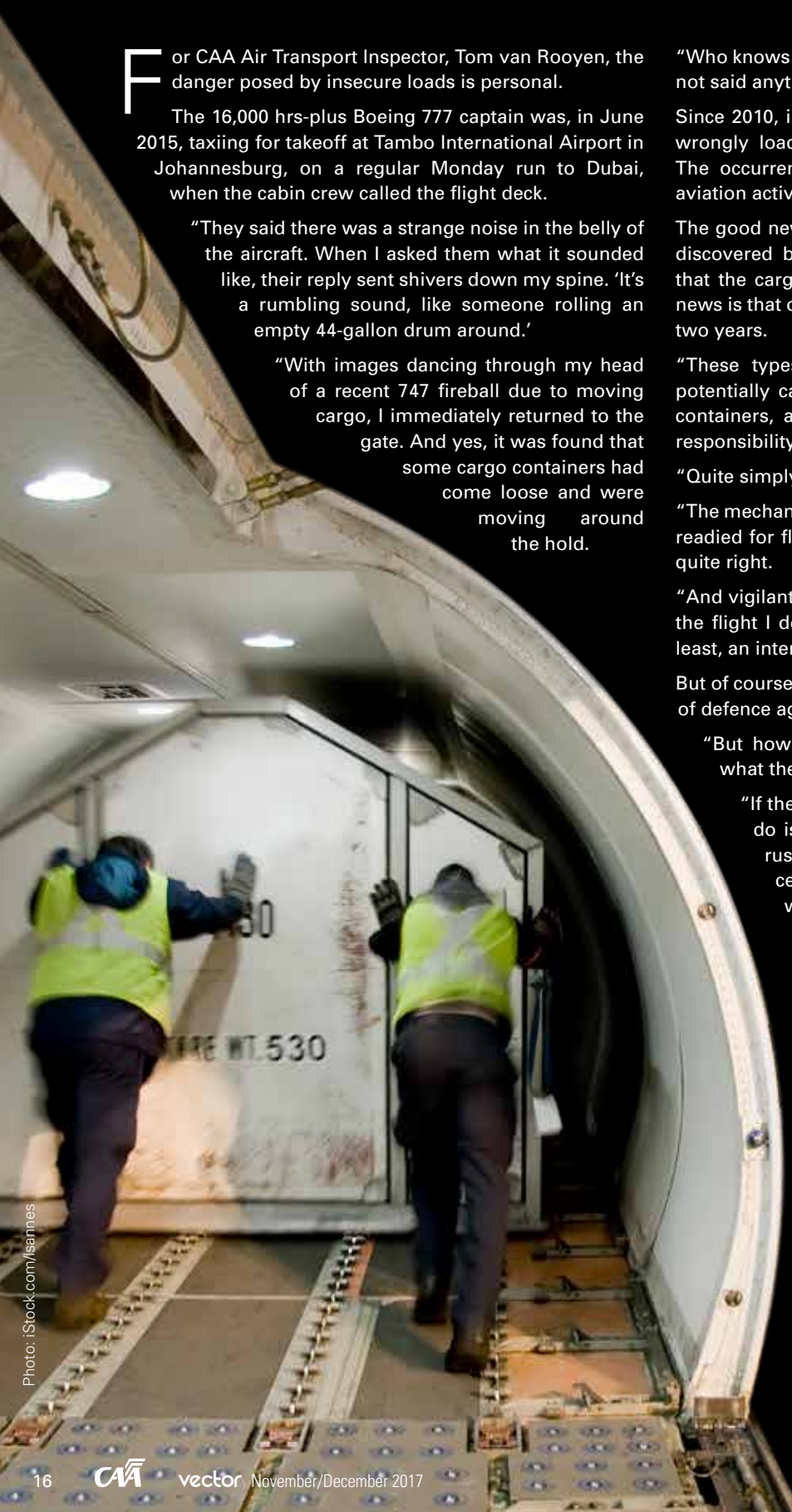


Photo: iStock.com/Isannes



# Responsibility

The US National Transportation Safety Board (NTSB) found “strong evidence” that the accident was due to a 12-tonne military vehicle breaking its restraints during takeoff, moving backwards and damaging two of the aircraft’s hydraulic systems and horizontal stabilizer drive mechanism components, making the aircraft uncontrollable.

Tragically, the crew knew before takeoff that there was a problem with insecure cargo. They discussed that on the previous leg from Camp Bastion, some straps had become loose, and one had broken.

Cockpit voice recorder data shows the captain was anxious about the straps, saying he found the cargo movement, even a few inches, “scary”. He hoped the loadmaster would beef up the straps, and not just replace the broken one.

But the captain accepted the first officer’s assurances that the loadmaster was “cinching” the straps down, and did not question any further.

Ultimately, says Rod Buchanan, CAA’s Team Leader of 121/129 Flight Operations, it’s the air transport operator that bears the responsibility to ensure ground handlers know about centre of gravity, and weight and balance.

“This is an industry-wide problem, where time pressure, limited training, and a lack of a sense of personal responsibility create the possibility of a mis-loading event.

“How often do managers arrange some training for their cargo handlers on the safety-critical nature of their job?

“It should be part and parcel of safety management systems that everyone in an operation – CEO down – should be concerned with how safety can be enhanced, including during ground handling.”

*“Making sure cargo, cargo containers, and luggage are stowed properly is everyone’s responsibility ... if something doesn’t look right, ask questions. And don’t stop asking questions until you are satisfied.”*

A manager of one New Zealand operation says his organisation has experienced several instances of mis-stowed cargo.

This is despite his organisation undertaking initial training of new ground handlers, and then regularly auditing the companies who have responsibility for their recurrent training.

He says attention to detail in loading of cargo can never be taken for granted – by anyone.

“In the most recent occurrence, the ground handlers confused two containers with similar identification numbers. One container, weighing a tonne, was positioned where the second one, weighing 800 kgs, should have been, down the back.

“The aircraft did take off, but felt so ‘different’ to the captain, he radioed the company in Auckland, which discovered the error.

“It ended safely, but could so easily not have.

“Now we have a ground handler whose sole job is to check how and where every container is loaded.”

Operators also influence the way in which their ground handlers carry out their role through the operator’s attitude to worker health and safety.

The NTSB report on the National Airlines accident found the loadmaster had been on duty for about 21 hours at the time of the accident. The report noted that cargo handling personnel were not certificated, with no duty hour limitations and rest requirements.

CAA Health and Safety Manager, Riki Tahau, says that health and safety law obliges operators to manage the risks associated with the work they require their employees to do.

“That includes ensuring that employees who carry out work capable of causing a risk in the workplace – in this case, an aircraft – are adequately and suitably trained so they don’t harm themselves or others,” he says.

“The law also requires an operator to manage the risks associated with employee fatigue.”

The manager from the New Zealand operation says given the safety-critical nature of what they do, it’s important that cargo handlers are looked after.

“In some centres, staff turnover is really high, which is a risk in itself.”

He considers ground handling operations to be a major risk to the organisation.

“Even with training, you need to check from time to time that they’re working according to standards.

“I check on the handlers every now and then, and sometimes I still have to say to them, ‘hey, it’s an aircraft you’re loading there, not a railway wagon’.” ■

# Not Meeting the Ground **U**

Always make sure you are setting your altimeter properly using the correct QNH, for both IFR and VFR operations.

**Q**NH is a 'Q' code that indicates atmospheric pressure adjusted to mean sea level for a given place and temperature. Like most countries, the QNH unit of measurement used in New Zealand is the international standard hectopascal (hPa).

The abbreviation 'QNH' survives from a time when Morse code was used because voice modulated radio was unsatisfactory. To make Morse code a more efficient means of communication, commonly used transmissions were incorporated into a Q code. For example, QEG meant "can I leave the parking area?" QNH continues to mean "barometric pressure adjusted to sea level". Most of the Q codes are no longer used.

## Your Responsibilities

The most representative QNH must be used by pilots to adjust their aircraft altimeter barometric setting so that the altimeter will correctly read their altitude above mean sea level.

QNH is so safety-critical that it can be provided only by Part 174 certificated organisations – currently MetService and Airways.

Part 91 sets out the altimeter setting requirements for pilots. They are summarised in *AIP New Zealand* ENR 1.7 Altimeter Setting Procedures.

The **aerodrome QNH** altimeter setting is the aerodrome level pressure reduced to mean sea level in accordance with the standard atmosphere.

The **Zone Area QNH** altimeter setting is the QNH setting applicable within the defined Area QNH Zones.

Without the most recent aerodrome QNH, or zone area QNH, your altitude may be dangerously different to nearby aircraft and the ground below – hopefully not the ground in front!

How different? Depending on the aerodrome, when on approach the minimum descent altitude (MDA) or decision altitude (DA) could be as low as 200 feet. In terms of QNH, 200 feet equates to roughly just 7 hPa.

What's more, with New Zealand's unique topography and rapidly changing weather patterns, changes in QNH can be greater than 10 hPa in very little time, and over very little distance.

For these reasons, it's critical that you do not use any pressure setting other than QNH (there's sometimes confusion with QFF, QFE or QNE). There are currently some inconsistencies in the QNH statements on the aerodrome plates in the AIP. These will be reviewed and amended through the normal AIRAC cycle.

## Remote QNH

There are a number of aerodromes that have published instrument approaches, but they do not provide an associated QNH source in the AIP aerodrome chart. In this situation, you need to use a **remote QNH** to calculate the MDA for that aerodrome.

This is done by adding 5 ft to the published MDA for every 1 NM in excess of 5 NM from the remote QNH source (the nearest available aerodrome QNH).

Remote QNH cannot be used for some instrument approaches, or at particular aerodromes. In such cases, the instructions on the aerodrome approach plates will state "Use [name of the aerodrome] QNH only".

Remote QNH also cannot be used when flying RNAV approaches with barometric vertical path guidance (Baro-VNAV) that is to LNAV/VNAV minima. The LNAV/VNAV minima entry on the approach chart will be annotated "Use of remote QNH NA".

## Altitude and Flight Levels

### Cruise Below Transition Altitude

New Zealand has a system of area QNH zones for flights cruising at or below the transition altitude (13,000 feet). These zones ensure all aircraft cruising in a given zone have their altimeters set in sync.

Each zone derives its QNH information from a primary or secondary source, such as an aerodrome QNH, or a well-placed weather station.

Using QNH from these zones also ensures that you maintain a safe distance from terrain when cruising at lower altitudes. Note that zone area QNH should not be used for instrument approaches and landings.

### Transition Layer

The transition layer exists to provide pilots with a vertical buffer for changing altimeter settings. Level flight in the transition layer between 13,000 ft and FL150 (or FL160 if the Zone Area QNH is 980 hPa or lower), is permitted only when authorized by ATC within controlled airspace.

The lowest flight level available for use above the transition altitude is normally FL150. However, where a zone QNH is 980 hPa or less, the minimum usable flight level for that zone increases to FL160.

# nexpectedly

## Cruise Above Transition Layer

Area QNH zones only extend up to the transition altitude (13,000 ft) in New Zealand. At or above the transition level (FL150 or FL160 if the Zone Area QNH is 980 hPa or less), all aircraft altimeters are set to the standard atmospheric pressure of 1013.2 hPa. ■

*"It's critical that you do not use any pressure setting other than QNH."*



**NOT FOR OPERATIONAL USE**

Altimeter setting procedures for pilots are in AIP New Zealand ENR 1.7, including a diagram showing the Transition Layer, and the QNH Zones shown here.

# Someone Told Me I Could.

Here's what pilots can do to maintain their aircraft without crashing through the rules.

As they travel the country, an issue increasingly occupying the minds of CAA Aviation Safety Advisers, John Keyzer and Steve Backhurst, is pilot maintenance.

"Under some conditions, it's okay for pilots to do their own maintenance," says South Island-based Steve, "but too many are tinkering with their aircraft in a manner so loose, it clearly risks safety and breaches the rules."

Steve says he'll visit a small aerodrome on a Friday afternoon and see hangar doors open, and pilots happily pottering away in the innards of their aircraft.

"But I know many of them will be untrained, and their work unauthorized and undocumented. And there'll be no manufacturer's 'Instructions for Continued Airworthiness' (ICAs) available, or the required tooling to do the job.

"It's not so much that pilots are doing maintenance that they shouldn't be doing," says Steve. "The problem is more the way they do it. They simply don't know, or don't care, what's involved to meet the safety standards of Part 43.

"Or, they're just plain ignorant of their obligations under the Civil Aviation Rules, and try to justify their actions by saying, 'someone told me I could do it like this'.



“Just because they’re physically capable of carrying out a maintenance action doesn’t mean they *can* do it.

“As a LAME, you soon learn that carrying out a maintenance task is not just the physical action. It’s the physical action *and* the compliance associated with that physical action.”

Steve says aircraft are a bit like boats and race cars.

“It’s not the cost of purchasing the toy that’s going to make you poor, it’s keeping it going.

“Owning your own aircraft means maintaining it in an airworthy condition. And that means using the services of a LAME for most maintenance.”

For the record, Part 43 describes what maintenance a pilot can do, *if* they are authorized by the aircraft’s operator, *and* that’s in writing (‘authorized maintenance’); *and* the pilot has been trained by a qualified LAME rated on that aircraft, *and* keeps a written record of that training.

Or, a pilot can carry out maintenance, but only under the direct supervision of an appropriately rated (that means on type) LAME. ‘Direct supervision’ means the LAME has to be right there in the hangar with the pilot, and not on the end of a cellphone.

## Instructions for Continued Airworthiness

“I remember visiting a helicopter pilot/operator,” says Steve, “who’d been carrying out repetitive torque event inspections on his Hughes 500. I could find no evidence he’d followed the manufacturer’s Service Bulletin, or used the proper tools or equipment. When I asked about his use of a 10x magnifying glass, which is a requirement for the job he’d been doing, he just looked blank.

*Continued over* >>



Photo: iStock.com/skyf

"Pilots must refer to the manufacturer's ICAs when they do a job. It must be the latest revision, whether that's an Airworthiness Directive, Service Bulletin, or other manufacturer's instructions. See rule 43.53(1) and (3)(i). The reference to the ICA needs to be recorded as per rule 43.69 and the aircraft released to service as per rules 43.103 and 43.105."

Anyone maintaining an aircraft must also use the correct tools, equipment, and test equipment set out by the manufacturer's Instructions for Continued Airworthiness. See rule 43.53(5).

Steve has another story. "A 19F aviation parts supplier told me about his customers who purchase spark plugs because Part 43 Appendix A.2 allows a pilot to replace those. More often than not, before the customer leaves, they will ask the parts supplier how tight to torque the plug to.

"Now, often manufacturers have a torque requirement and that would be found in the ICA, so clearly these pilots are doing the job without any reference to them.

"I can guarantee that if I was to ask those pilots about the job, there'd be nothing recorded within the maintenance documents, they wouldn't be able to show me a calibrated torque wrench, and they definitely wouldn't be able to show me the manufacturer's ICAs, nor a document signed by a LAME showing that the pilots had been trained to carry out the task."

North Island-based John Keyzer says even a trained pilot maintaining an aircraft they are authorized to maintain, can perform only the maintenance listed in Part 43, Appendices A.1 and A.2.

"For example, some pilots think they can remove a part, if they get a LAME to reinstall it. However, removing a part is still maintenance, and needs to be carried out in compliance with the rules.

"Some tasks may need special tools, equipment, and – most importantly of all – sometimes a subsequent inspection (an example being a duplicate inspection). See Part 43 A.1(6) (iv). Those maintenance tasks cannot therefore be carried out by a pilot under authorized maintenance 43.51(b) and to do so will require a Certificate of Maintenance Approval issued in accordance with Part 66 Subpart D.

"This is really important. If the job is so safety-critical that it needs that subsequent inspection, a pilot cannot do it as 'authorized maintenance'. It's a higher bar to help prevent accidents."

## Records

As outlined above, any maintenance a pilot carries out must be fully documented and released to service.

Form CA006 *Technical Log* (or equivalent) must record details of the maintenance carried out, and a release to service (RTS) by the person certified to carry out that maintenance. Those details must also be summarised in the aircraft logbook.

The tech log is to be carried in the aircraft so the information contained in it is available to each pilot flying the aircraft, before they fly.

Using Form CAA400 *Maintenance Record Sheet* is not mandatory, but it's an extension of Section 3 of the tech log. It provides a record of maintenance and the required RTS. The top copy is removed, summarised in the aircraft logbook and kept with the maintenance records. The lower copy is stored in the aircraft, along with the technical log, and is reviewed by the pilot before each flight.

Read Advisory Circular AC91-6 *Aircraft technical log* for more guidance. To get free tech log forms and maintenance record sheets, email [info@caa.govt.nz](mailto:info@caa.govt.nz).

## Why the Fuss?

"It's not repairing your car," says Steve Backhurst.

"If I change the oil filter and oil in my vehicle, I just go ahead and do it. I don't need to comply with everything associated with doing the same job in aviation.

"If I've installed the filter incorrectly or forgotten to tighten the sump plug, and the result is a major oil leak, I just pull to the side of the road.

"But if it's something safety-critical, like the vehicle's brakes that I'm repairing, you can be sure I'm going to get someone else, who knows what they're doing, to check what I've done, and that would also include testing before hitting the open road."

John Keyzer agrees that compliance with Part 43 is an important safety issue.

"For example, if a pilot installs role equipment incorrectly, it could ultimately affect the aircraft's airworthiness. An incorrectly installed set of dual controls could possibly lead to a loss of control of the aircraft or an engine hot start. Instances like this happen less often than they used to, as people become more aware of the importance of doing things right. But there are still too many instances of this sort of occurrence for anyone to be complacent."

## Learn To Do It Properly

"There are obviously advantages to doing some maintenance on your own aircraft," says John Keyzer. "You learn more about it, you can maintain it at any time without waiting for a LAME, and of course, you save money.

"It's extremely satisfying," he says. "But it must be done according to safety standards, as described in the Civil Aviation Rules."

A good start is to book a place at a CAA Maintenance Controller Course.

You'll learn more about your responsibilities for the continued airworthiness of your aircraft, by refreshing your knowledge of the rules, and you'll receive practical advice regarding training, LAME supervision, ICAs, and recording of maintenance.

Go to [www.caa.govt.nz](http://www.caa.govt.nz), "Quick Links > Seminars and Courses".

For more information about obtaining a Certificate of Maintenance Approval, contact the CAA's licensing unit, [licensing@caa.govt.nz](mailto:licensing@caa.govt.nz), or the CAA Aviation Safety Advisers, [steve.backhurst@caa.govt.nz](mailto:steve.backhurst@caa.govt.nz), [john.keyzer@caa.govt.nz](mailto:john.keyzer@caa.govt.nz). ■

# Peer Assistance Network – A ‘Safe Harbour’

Since its inception in 2015, a peer support programme designed to help stressed or troubled aviation workers has helped 150 of them get back on track.

**B**efore contacting the Peer Assistance Network (PAN), an international airline first officer had tried to take his own life in a hotel room.

He'd been suffering from undiagnosed depression – the result of a chemical imbalance – for some time, and hadn't wanted to talk about it for fear of losing his career.

Two months after seeking the help he needed, he was feeling better and back flying.

In the two years since PAN arrived in New Zealand (modelled on a 20-year old Qantas Australia programme) it's helped more than 150 aviation professionals, from trainees to senior airline captains and air traffic controllers.

"Their issues have ranged from relationship difficulties, to earthquake stress, to overwhelming anxiety about upcoming sim tests," says Captain Andy Pender, the medical and welfare director of the air line pilots' association, NZALPA.

Central to PAN is a volunteer network of aviation professionals, who all understand the special pressure of working in the industry. They've been trained by psychologists, as well as

specialists in suicide prevention, grief counselling, and listening skills, among other experts, to be the first point of contact for someone who wants to talk.

They've also been coached in where the resources are that can offer practical help – such as financial assistance, an employment mediation service, and the HIMS\* programme.

If necessary, a PAN peer support volunteer refers someone to a medical professional.

It costs an airline organisation \$20 per person to have their staff covered by PAN, and so far, Air New Zealand, Virgin Australia and Jetconnect have signed up.

But the programme is strictly non-commercial.

"Even if aviation workers – who are neither covered, nor NZALPA members – call us," says Andy, "we will not turn them away."

While an increasing number of employers are referring their workers – and their employees are reportedly relieved to be referred – self-referring is still rare.

*Continued over >>*



\* Human Intervention Motivation Study – aims to help aviation professionals whose use of alcohol or other drugs is of concern. [www.hims.org.nz](http://www.hims.org.nz).

» Continued from previous page

“We have this culture of soldiering on”, says Andy. “Anything that smacks of struggling with emotional issues has largely been – and for some, still is – a source of shame.

“But troughs and peaks are part of life. Seeking help is just a sensible move in looking after yourself.

“I think attitudes are changing however – certainly among younger people. Mental health issues, and especially the need to talk about them, are being discussed more openly in wider New Zealand society. That’s making it more acceptable for both men and women to seek out some help.”

Andy says NZALPA is currently recruiting for senior PAN volunteers who older aviation workers might be more ready to open up to. A women-only assistance service is also being established. The programme is also wanting to encourage more GA workers to use the service.

“Any aviation professional in New Zealand, if they’re going through a period of low mood, stress, or anxiety – things are

just not quite right – we want PAN to be at the forefront of their mind. Whether they’re the captain of a Boeing 777 or the captain of Cherokee PA28-140, it doesn’t matter.

“We need every pilot in New Zealand to know that there is a confidential, secure, trusted service that they can call upon, without risk, to say, ‘hey, is it normal that for a couple of days every now and again I’m not feeling quite right? Can we have a chat about that?’

“People can be reassured that the thoughts and feelings they’re experiencing are completely normal, and we can help them to get it sorted.

“Ultimately, PAN is about improving aviation safety in New Zealand, and that means being there for anyone in the industry who needs a ‘safe harbour’ for a while.”

Anyone wanting to talk can ring 0800 NZALPA – 0800 692 572 – and ask to speak to the PAN programme. There’s someone available 24 hours. ■

## On the Web

### PPL Medical Certification Review

In one of the larger responses the CAA has received from the aviation community on an issue, there were 299 submissions during consultation on the Private Pilot Licence medical certification review.

See [www.caa.govt.nz](http://www.caa.govt.nz), “Quick Links > Rules > Regulatory Policy” for a summary of the responses.

### CAA Annual Report

Record passenger numbers, the growth of threats to aviation security, new technologies, and the huge growth in drone ownership are among the challenges the CAA faced in its 2016–2017 year.

The CAA’s Annual Report is now on the CAA web site, [www.caa.govt.nz](http://www.caa.govt.nz), see “About Us > Annual Reports and Statements of Intent”.

### RIU Annual Report

On the same web page is the 2016–2017 report of the Regulatory Investigations Unit, outlining to the aviation sector and public the actions taken by the unit over that time period. ■



## Small Issues Project

With the signing of the Small Issues 2016–17 Rule package by the former Associate Minister of Transport, Tim Macindoe, the first CAA Notice came into effect on 30 October 2017.

The rule package made changes to separate Parts, each of which alone did not justify a separate proposal.

The issues in the project are associated with:

- » reporting of tonnage on freight flights (Part 12)
- » maintenance of large balloons (Part 43)
- » airworthiness review period for non-hire or reward aircraft (Part 91), see [www.caa.govt.nz/aircraft](http://www.caa.govt.nz/aircraft)
- » manipulation of flight controls in adventure aviation (Part 115)
- » EDTO requirements (Part 121)
- » options for calculating runway landing distances (Parts 121, 125, 135)
- » emergency landings for SEIFR passenger operations (Part 125)
- » Robinson R22s and R44s (Part 61).

The amendment relating to Robinson helicopters allows the Director of Civil Aviation, using a CAA Notice, to impose requirements and conditions regarding the use and operation of Robinson helicopters.

Such Notices are limited to the scope of the empowering rule. They allow for greater flexibility and responsiveness to changing technical standards and requirements than through the more substantive rule-making process.

More information about these amendments can be found on the CAA web site, [www.caa.govt.nz/rules](http://www.caa.govt.nz/rules). ■



## A Personnel and Flight Training Reminder

If you want your licence issued or amended before the Christmas/New Year holidays, please get your applications in early. The lead-up to Christmas is a very busy time for the CAA's Personnel and Flight Training unit. The last day for the issue of licences in 2017 will be 22 December. Licences will again be issued from 8 January 2018.

Licence applications are dealt with on a first-in, first-processed basis. Calling the unit does not give your application greater priority, and only takes staff away from processing applications.

If you're applying for a new licence, you will need to satisfy the Director of Civil Aviation that you meet the 'fit and proper person' (FPP) requirements of the Civil Aviation Act 1990.

Obtaining the necessary information can take several weeks. As a rough guide, allow six weeks before your flight test to complete the FPP process.

If you need to renew your medical certificate, take into account the time that may take, particularly if you require a specialist examination.

The CAA will be closed from 2 pm on Friday 22 December 2017 until 8 am on Wednesday 3 January 2018.



## How to Get Aviation Publications

### AIP New Zealand

AIP New Zealand is available free on the Internet, [www.aip.net.nz](http://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](http://www.aipshop.co.nz).

### Pilot and Aircraft Logbooks

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

### Rules, Advisory Circulars, Airworthiness Directives

These are available free from the CAA 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](mailto:aero@caa.govt.nz).

To allow for processing, the CAA needs to be notified **at least one week** before the Aeropath (Airways) published cut-off date, 2017/18.

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	Aeropath (Airways) Cut-off Date	Effective Date
8 Nov 2017	15 Nov 2017	1 Feb 2018
20 Dec 2017	27 Dec 2017	1 Mar 2018
17 Jan 2018	24 Jan 2018	29 Mar 2018

See [www.caa.govt.nz/aip](http://www.caa.govt.nz/aip) to view the AIP cut-off dates for 2017/18.

## Aviation Safety Advisers

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

**Don Waters**  
(North Island)

Mobile: +64 27 485 2096  
Email: [Don.Waters@caa.govt.nz](mailto:Don.Waters@caa.govt.nz)

**John Keyzer**  
(Maintenance, North Island)

Mobile: +64 27 213 0507  
Email: [John.Keyzer@caa.govt.nz](mailto:John.Keyzer@caa.govt.nz)

**Carlton Campbell**  
(South Island)

Mobile: +64 27 242 9673  
Email: [Carlton.Campbell@caa.govt.nz](mailto:Carlton.Campbell@caa.govt.nz)

**Steve Backhurst**  
(Maintenance, South Island)

Mobile: +64 27 285 2022  
Email: [Steve.Backhurst@caa.govt.nz](mailto:Steve.Backhurst@caa.govt.nz)

## Report Safety and Security Concerns

Available office hours (voicemail after hours).

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

[isi@caa.govt.nz](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

More Accident Briefs can be seen on the CAA web site, [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).

## VH-EQF Bell 204B

Date and Time:	21-Jun-2017 at 10:30
Location:	Enroute Taupo
POB:	1
Damage:	Destroyed
Nature of Flight:	Ferry/Positioning
Pilot Licence:	Private Pilot Licence (Aeroplane)
Age:	42 yrs

While enroute to a maintenance facility to troubleshoot avionics degradation, the pilot smelled something burning and turned off all unnecessary electrical items. Smoke and flames were observed through gaps in the instrument panel.

The pilot identified a clearing approximately 1–2 miles from his position and turned to land. He shut down the engine and performed an autorotation to the clearing. Due to smoke in the cockpit, he was unable to see out of the front windscreen and made his approach and landing by looking through the chin bubble.

After landing, he unsuccessfully attempted to suppress the fire with a handheld fire extinguisher. He secured his licence and 'crash bag' and moved away from the helicopter, which was then engulfed in flames and destroyed. The pilot built a signal fire and used flares to signal a passing aircraft and was on site for approximately 3.5 hours before being located.

There was insufficient evidence remaining to determine the source of the fire. The pilot had observed rodent excrement in the aircraft several days prior to the accident. The hypotheses established in the insurer's report are that the degradation of the avionics may have been due to rodent activity, and a nest in the heater duct located behind the dash may have acted as a source of ignition.

The remains of the aircraft were recovered from the site, and the pilot did not sustain any injuries in the accident.

[CAA Occurrence Ref 17/3636](#)

## ZK-SLS Maule M-5-210C

Date and Time:	17-Mar-2017 at 15:56
Location:	Ruahine Corner
Nature of Flight:	Private other

During landing on a grass strip, the aircraft bounced, and the pilot elected to begin a go-around. During the go-around, the aircraft drifted sideways, and one wheel entered the longer tussock, pulling the aircraft off the strip. The pilot aborted the go-around, moments later coming to rest off the side of the strip.

The pilot will give more consideration to the pressure altitude of particular airstrips, as well as the handling considerations during a bounce.

[CAA Occurrence Ref 17/1593](#)

## ZK-IIA Robinson R44 II

Date and Time:	01-Mar-2017 at 07:15
Location:	Raukokore River
POB:	2
Damage:	Substantial
Nature of Flight:	Private Other
Pilot Licence:	Private Pilot Licence (Helicopter)
Age:	56 yrs
Flying Hours (Total):	217
Flying Hours (on Type):	217
Last 90 Days:	23

During a private operation, the pilot in command approached to land on a river bank. When the pilot flared the aircraft for landing, the tail rotor contacted the ground and came free. The aircraft then spun a number of times before coming to rest on its left side.

There was substantial damage to the aircraft tail boom, main rotor blades, left side of the fuselage and firewall.

Operators should make use of suitable landing areas and maintain awareness of their approach profile to ensure they keep sufficient tail rotor clearance at all times.

[CAA Occurrence Ref 17/935](#)

## ZK-DPF Cessna A185F

Date and Time:	20-Jan-2017 at 11:33
Location:	Kekerengu
POB:	4
Damage:	Destroyed
Nature of Flight:	Private Other
Pilot Licence:	Private Pilot Licence (Aeroplane)
Age:	57 yrs
Flying Hours (Total):	1090
Flying Hours (on Type):	1032
Last 90 Days:	10

While landing up-slope on a private airstrip, the aircraft likely encountered a sudden windshear or tail wind, causing rapid descent and a very hard landing. The pilot lost directional control of the aircraft, which then departed the airstrip down an embankment.

The pilot and front seat passenger suffered serious back and internal injuries from the initial ground contact, and were trapped in the aircraft until emergency services arrived. The two people seated in the rear suffered minor injuries and were able to free themselves from the aircraft.

Although the pilot had not landed on this particular airstrip previously, he was familiar with the use of similar types of airstrips.

It is likely that a sea breeze was beginning to build in strength at the time of the approach to land, giving a fluctuating tailwind which was not detected by the pilot. There was no windsock installed at the airstrip which could have provided useful wind information.

[CAA Occurrence Ref 17/154](#)

# 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](http://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

## Eurocopter AS 350 B2

### Power Turbine Governor

Part Manufacturer:	Honeywell
Part Number:	4-301-289-05
ATA Chapter:	7320
TSI Hours:	379.2
TSO Hours:	379.2

While conducting sling load operations, the pilot experienced a loss of engine power during the climb at approximately 2000 ft AGL. The pilot jettisoned the sling load and performed an autorotation to a nearby riverbed. During the autorotation, the pilot noted at least two instances where engine power was restored or partially restored, indicated by uncommanded yaw rates. The engine was shut down after landing.

The engineering investigation found that the power turbine governor bearings failed. This type of failure has been addressed by Honeywell through the introduction of new drive bearing design, a larger diameter spool bearing, a new formula grease for both the drive bearing and spool bearings, a new flyweight design, and a new bearing cap design (Service Bulletin Numbers GT-73-0387, GT-73-0390, and LTS101-73-20-0280). These Service Bulletins are designated by Honeywell as 'CATEGORY 1' and typically require 'urgent action'.

The power turbine governor was replaced with P/N 4-301-289-11, in accordance with current Service Bulletins.

[CAA Occurrence Ref 17/3533](#)

## Britten-Norman BN2A

### Spark Plug

ATA Chapter	7420
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Intermittent engine vibrations and surging were noticed by the pilot during flight. Unable to determine which engine was causing the problem, the pilot left both operating and returned home. On approach at lower power settings the vibrations and surging were not apparent, and the aircraft landed safely.

Maintenance investigation found that one spark plug on the right engine was intermittently firing, creating fluctuations in engine power. The plugs were cleaned and the aircraft was released to service without further issues.

[CAA Occurrence Ref 17/2671](#)

## Hughes 369D

### Manual Release Cable

While conducting sling load operations, the cargo hook inadvertently released the load during manoeuvring flight. The helicopter was removed from service and ferried to the maintenance facility for troubleshooting. No abnormalities had been identified during preflight checks.

The engineering investigation found that the clamps securing the manual release cable to the cyclic had allowed the outer cable to move over time, resulting in tension being placed on the inner cable. When the helicopter entered a left turn the pre-load on the cable, coupled with the movement of the cargo hook, activated the release mechanism.

The cable assembly was adjusted and secured to the cyclic with new clamps, and operational checks were completed.

In addition to the component replacement, the company informed their pilots of the fault that resulted in the inadvertent release. The pre-operational checks were updated to require a check of the manual release lever, cable condition and placement, and to ensure that the cable moves freely through the floor and belly voids during cyclic inputs.

[CAA Occurrence Ref 17/3848](#)

## Robinson R22 Beta

### Engine

ATA Chapter	7200
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During cruise flight, the pilot observed a decrease in rotor and engine RPM. The pilot decreased the collective pitch to maintain rotor RPM, and the engine RPM continued to decrease. The pilot entered an autorotation and executed an emergency landing with partial power.

A licensed engineer conducted an air filter inspection, fuel flow and contamination checks, an engine compression test, a magneto distributor gear inspection, and an engine to magneto timing check. No defects were identified. Ground runs and hover checks were carried out with no faults found, and the helicopter was flown to the maintenance facility for further investigation.

Further engineering inspections resulted in no faults found. Some components that were found serviceable were replaced with new parts as a precaution. An operational flight check was completed with no faults found.

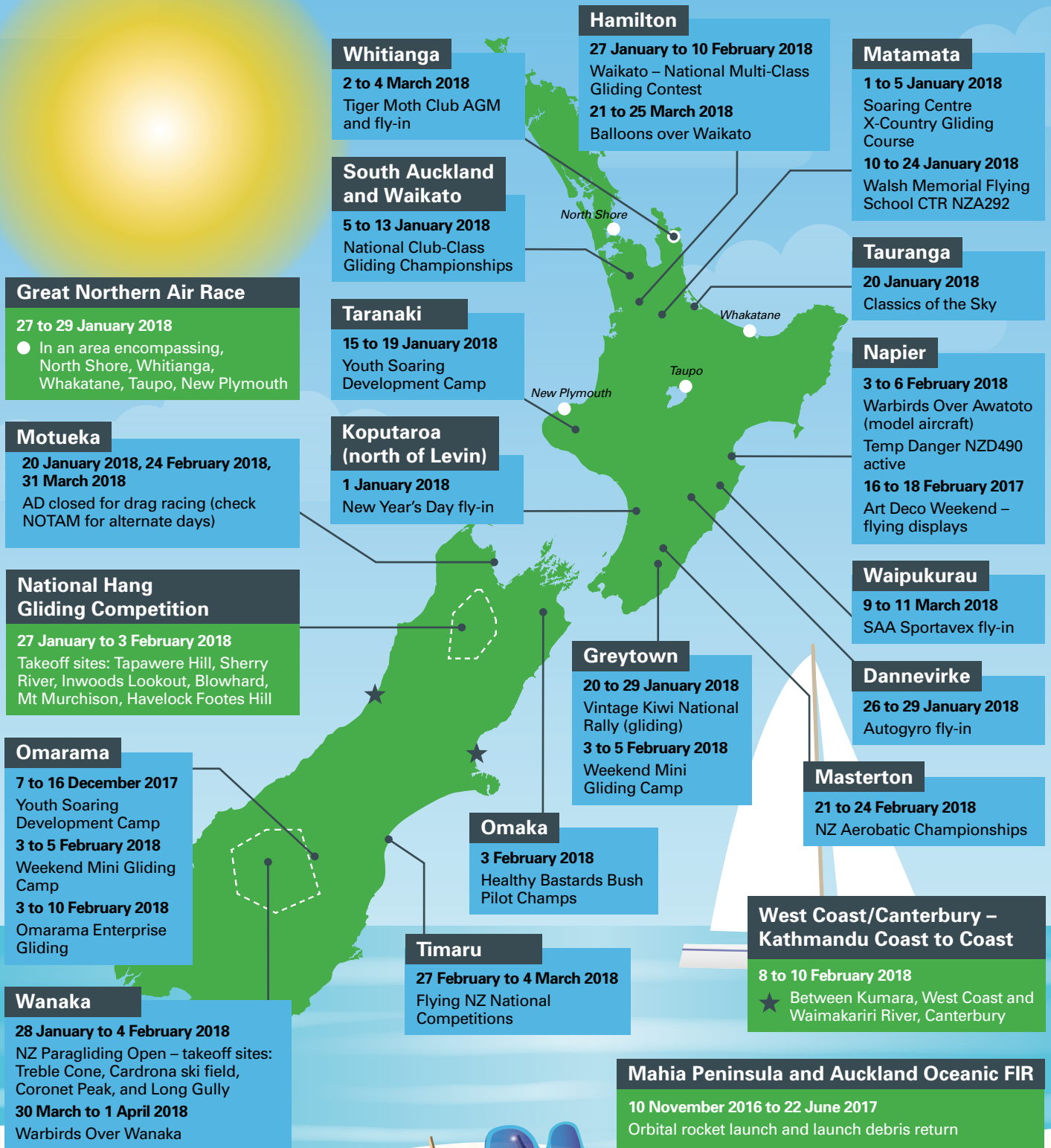
Robinson Helicopter Company was notified of the incident and advised that carburetor icing may have been a contributing factor, based on the environmental conditions (temperature and relative humidity).

[CAA Occurrence Ref 17/943](#)

# Summer Traffic Busy Spots

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

This map shows the known flying events between late November 2017 and late March 2018 at the time of publication.



Keep these events in your calendar