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POINTING TO SAFER AVIATION

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Stay or Go?

Lessons From Air Ambulance Ops

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

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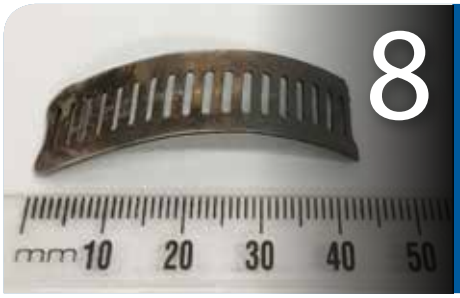
Stay or Go? Lessons From Air Ambulance Ops

Despite the inherent dangers in air ambulance flying, the sector has relatively few accidents. Three pilots share their thoughts on the sometimes very difficult decision they have to make, when someone needs them, but the weather is closing in.



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Amending SARTIME, Terminating Flight Plans

Forgetful pilots have been tracked down to aero club bars; returning their aircraft to the hangar; and driving down the highway. Don't launch a full scale search operation by failing to terminate your flight plan.

Cover: ZK-HUP from Helicopters Otago rescues a hypothermic patient, stranded on rocks after his boat's engine failed, near Dunedin's Tunnel Beach. Seven pilots, along with 14 St John paramedics serve 23 per cent of New Zealand's land mass. See story page 4.
Cover photo courtesy of Stephen Jaquiery.

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Not Flying Much? **Beat the Rust**

Piston engines function best when flown regularly, but how to keep them in good condition if you don't get into the air so often?

A piston engine flown infrequently is prone to corrosion and contamination, both of which can reduce its service life.

Engine manufacturer Lycoming even add 200 hours to the TBO of some of their engines if they're flown at least 40 hours a month.

Neville Williamson, Chief Engineer at Dunedin's Flightline Aviation, knows first-hand the benefits of regular use.

"We've found that aeroplanes left sitting around develop defects, while aeroplanes used every day don't. There's nothing like actually flying the aircraft – that's what they're designed to do."

Manufacturers generally recommend that a preservation regime be implemented for engines expected to sit unused for longer than 30 days.

Engine Temperature

Regular flight brings an engine up to operating temperature, which will vaporise and eliminate the condensation that causes corrosion.

"The oil temperature really needs to get into the green to boil off the moisture," Neville says.

When mixed with the by-products of combustion, moisture can also form acidic compounds which etch the metal and increase the chances of corrosion.

The corrosion itself then becomes an abrasive, which further worsens the problem.

Oil and Preservatives

Oil changes are typically specified by engine manufacturers in both an hour time limit, and a calendar time limit.

Changing the oil means removing contaminants conducive to corrosion. So, if an aircraft is flown infrequently, it's vital that the calendar time limit isn't ignored.

For longer time frames, sending an engine through a corrosion inhibition process can prove far more cost-effective than having to fix the corrosion at a later date.

"People who aren't going to use their aircraft over an extended period, for example leaving it in the hangar over winter, should be getting their engine inhibited," suggests Neville.

Engine Ground Runs

An engine ground run should not be considered an alternative to regular flight, and can in fact encourage corrosion.

A ground run will heat and cool the engine, a process creating condensation, but the heat itself won't be enough to vaporise the moisture.

"Ground running won't usually get the oil and cylinder head temperatures up high enough to make a difference," says Neville.

"Doing so once a month can do more damage than good, because it only drives moisture from the pores of the material to the surface."

Other Considerations

Pulling an engine through by hand helps guard against rings sticking, but it also potentially exacerbates problems.

Pulling the engine through can wipe oil away from the cylinder walls, cam, and followers. That results in additional wear at the next engine start, leaving the engine more vulnerable to corrosion.

Aside from the inherent problems of corrosion, dry seals can also break down over time, magnetos could suffer, and moisture may build up around impulse couplings.

Attempting to start an engine with a battery that's known to be flat is also discouraged. A failed start can result in fuel washing away the protective coating of oil, leaving an engine more prone to corrosion. It is much better to park the aircraft until the battery can be changed.

For the long-term health of your aircraft engine, there is simply no substitute for regular flight. Contact your engine manufacturer or engineer for further advice. ■

Photo: istockphoto.com/portfolio/Lepro

Stay or Go? Lessons From

Pilots can be natural seekers of excitement, taking pride in flying skilfully in challenging conditions. Throw in altruism, and external pressures to fly, and you have air ambulance flying. It could be a toxic combination. But the air ambulance sector doesn't figure highly in the accident stats. *Vector* asked air ambulance pilots what they could share with other aviators.

For a high risk sector, New Zealand's air ambulance field has had relatively few accidents.

Despite the inherent dangers in night flying, human winching, remote locations, single pilot operations, IFR, tight constraints, and pressure to fly, the New Zealand air ambulance sector has experienced just two accidents since 2006.

Granted, air ambulance pilots are recruited from the pool of more experienced pilots, and they receive continual training as part of the job.

But they also employ a robust process to subdue any 'mission mentality' – thoughts about how critical it is that they fly – that helps them come to a rational go, no-go decision.

Here, air ambulance pilots with almost 60 years of emergency medical flying between them, share some tips about that process.

"Despite the pressure of knowing that someone, somewhere, needs our help," says Barry Vincent, Chief VFR Pilot with Search and Rescue Services, "the number one principle is the pilot doesn't risk the lives of an entire crew trying to help."

So the pilots keep a constant watch on the weather throughout their duty period. Long before they get a call, they've gathered all the weather information they can – area and terminal aerodrome forecasts, rain radar charts, and MetService predictions.

Neil Moore, 3,250 air ambulance operations – and now CAA Safety Information Technical Specialist – says the key is to gather as much information as possible, building a picture of the conditions.

He says local knowledge is important for building that picture as well.

"If I was headed to the Chathams for instance, I might get the Met man there out of bed, talk to the island police officer, talk to the local operator.

"It was good building a relationship with local people – someone to confirm what you might be thinking anyway. And relationships with the locals benefitted me in other ways. Flying to the Chathams at night in the early days – before permanent runway lighting – someone always laid out battery lanterns to light the runway for us."

The pilots say if the forecast weather is terrible the decision to stay on the ground is easy. It becomes more difficult if the weather is marginal.

"For instance the conditions might be okay to fly in," says Neil, "but they could make for an uncomfortable flight for the patient.

"You're constantly reading cloud to provide the smoothest ride possible but sometimes, however you fly, it's not going to be pleasant.

"So you tend to put it on the medical crew to make the decision, in the interests of the patient's needs."

"Sometimes, you know you can get in somewhere," agrees Peter Turnbull of Northland Emergency Services Trust (NEST), "but maybe not out again. So you give the medical team a percentage chance of returning, and leave the final decision to them."

Photo courtesy of Fairfax Media NZ / Taranaki Daily News

The Taranaki Rescue Helicopter Trust Agusta 109E Power. Sometimes working alongside volunteer marine or alpine SAR specialists, the team of two pilots and two crewmen flew 160 operations in 2016.

Air Ambulance Ops

Acknowledging Limitations

The air ambulance pilots, despite what they do for a living, are no gung-ho heroes.

"We're always mindful of the limit of our abilities," says Neil Moore.

"If you're not, deep down, happy about what you're planning to do," he advises, "stay on the ground."

"You do have to recognise, yourself, what your limitations are," says Peter Turnbull. "There's no external meter to tell you where they lie. And you have to be disciplined about not going beyond them.

"It takes maturity and self-awareness to make the appropriate decision."

> *"If you're questioning 'should I be here, should I not be here?' you've already made your decision. You just need to acknowledge that."*

But Peter says technology is certainly helping with that decision.

"MetFlight is improving all the time, the information we have access to now is tremendous compared with a few years ago. There's really no excuse for getting into a weather situation these days."

Something else being increasingly used in the sector is a formal risk assessment tool (see "In Support of the FRAT" on the following page).

The tool gives a score based on answers to questions about personal preflight, and other forms of preparation. Those scores are tallied to result in a go, no-go recommendation.

The operators who use it say it takes the heat out of having to make a possibly more subjective decision.

The Role of Not Knowing

One thing pilots don't tend to factor into their decision is the detail about the patient, which defuses the pressure they may otherwise feel to fly.

Barry Vincent is given only a colour code, reflecting the severity of the patient's condition, but no details.

"We do know a code red is a fairly serious injury or medical event. There's always underlying pressure, because we're never going to get called unless the person needs help. But the safety of everyone on board is paramount."

Even if Neil Moore did know the state of the patient, it never really influenced him.

"By that time I'd made a decision and that was that."

Peter Turnbull of NEST says he's never told.

"We just know where they are. I think it's important we focus on the aviation side of things, and not get involved in the patient's needs."

Taking the Time

In a sector you'd think would be focussed on speed, the pilots agree they take the time they need for proper preparation.

Most of the preparation has already been done of course, and while target times do exist for some organisations – usually around 10 minutes between call and takeoff – Peter Turnbull, for one, deliberately does not observe any preset times.

"I observe a 'timely response commensurate with good aviation practice'," he says.

"Some jobs need unusual types of equipment, or specialist personnel. It can be difficult to predict whether you will need them, and they can take time to assemble. That's just the reality."

Continued over »

Continued from previous page

The pilots say they might have to check something like the location of wires near their planned destination. Information like that cannot be rushed. If the window of opportunity to fly is missed because of longer preparations, that's just the way it goes.

While it would seem logical to find the reasons to support a 'go' decision, some operators reverse that, and base their decision on identifying possible reasons not to go.

Going through each possible reason not to take off, and finding that one by one, they don't apply, the pilots say when they run out of reasons not to go, they go.

Deciding No

The pilots agree that an organisation must back the decision of a captain to turn back, or not to take off.

"Sometimes it's physically impossible to do things, and that decision always weighs heavily on the crews," says Barry Vincent.

"But that's the nature of the work. A captain's decision should be the end of the conversation."

"Two hours after you make the decision not to go," says Peter Turnbull, of his own organisation, "no-one is even commenting on it.

"There will almost always be a Plan B. I'd say only about 10 per cent of flights can be done just by helicopter. To ships or an island perhaps, maybe in Fiordland."

"You have to respect the comfort zone of the less experienced captains," says Neil Moore. "Their seniors need to back them up. I would say as their training captain, 'would you like me to come along, and we'll just have a look?' But if they made the decision not to go, that was fine.

"As time rolls along, they will quietly get themselves up to a comfort zone that's better than what it was two years before. It's just exposure."

Being Flexible

Barry Vincent says that having made the 'go' decision, pilots are constantly reassessing that.

"Decision making is something that starts long before you get into the cockpit, but it doesn't happen just once – during planning. It happens throughout the time you're in the cockpit. You have to be really situationally aware, re-evaluating all the time, according to the changing environment as you fly."

He says Search and Rescue Services' crews are trained in Crew Resource Management. An important aspect of CRM is empowering any crew member to raise a concern and stop the operation if they feel it is unsafe.

"So while the pilot-in-command is ultimately responsible, the crew and paramedics are also contributing information about whether a flight should continue.

"Obviously there's a number of factors in that – weather and daylight, or the nature of the job changes. A beacon has gone off and you're going out to find someone. You're told they're in a clearing, but when you get there, it's a complex winch job. So you have to be ready to re-plan.

"We're never reluctant to change our original decision, if it's needed. And that includes deciding to continue, or not."

Neil Moore says night flying, especially, requires Plan B, C, and D.

"You don't always have the benefit of air traffic control, and gathering weather information at night is harder. I developed a network of people I could ring to confirm weather, but of course, I couldn't always ring them during the night."

Barry Vincent agrees about the added difficulty of flying at night.

"When the sun goes down, I begin to assess if it's a flyable night, weather-wise. As for flights during the day, forecasts are always checked against actual conditions, particularly at the rescue scene, at the time of a callout.

"But there are added complications at night. Are the conditions within the limits for flying with night vision goggles? What if the job is in a remote location? What if it's something more complicated than a straight forward medevac?

"We might be doing a hospital transfer, but the patient's condition deteriorates, so we're asked by our medics to land, for some medical reason. So we need to decide where we're going to land. Where is suitable? Where is safe? And this is at night. So this is where situational awareness is a continually evolving process."

"We are Maturing"

Peter Turnbull says one of the big drivers of safety in the sector has been the development of industry standards.

"They've calmed the industry down a lot. We're maturing as a sector, and everyone is singing from the same hymn sheet.

"It's generally accepted that, unless someone has different, or better, equipment peculiar to a certain circumstance, everyone pretty much gives the same go, no-go answer. The competition has been taken out of it."

Barry Vincent says, "We work in a team, there is always someone we can consult. But GA pilots need to avail themselves of every resource they can because they are often by themselves. They shouldn't be afraid to ask for help, get on the radio, use technology, use local knowledge, use the opinions of others if they do have passengers, and finally take notice of their gut feeling.

"If you're questioning 'should I be here, should I not be here?' you've already made your decision. You just need to acknowledge that." ■

In Support of the FRAT

The Flight Risk Analysis Tool, or FRAT, is a visual instrument designed to help pilots proactively evaluate the risks of the flight and make better go, no-go decisions.

Using a FRAT to put everything on paper allows the pilot to graphically depict risk limits, free from the pressure of an impending flight or maintenance task.

Ninety percent of the FRAT can be completed as soon as the pilot comes on duty. It can also be used where the job does not look 'on', but it allows some disciplined thinking about what is possible, and a no-go can become a 'go'.

You can see one example of a FRAT at:
www.aeronauticalsafety.com > Downloads > EHEST – Pre-Flight Risk Management Checklist

Opposite page: Lakes District Air Rescue Trust training with the Wakatipu mountain rescue team in 'human external transport' above Lake Wakatipu in 2010.

Image courtesy of Chris Prudden.

"There's always underlying pressure, because we're never going to get called unless the person needs help. But the safety of everyone on board is paramount."

FUEL FOR THOUGHT

The runway behind you, the air above you, and the fuel you left behind…

Vivid recollections and advice from a number of high-flying Kiwis showed why you can't afford to have your head in the clouds where fuel is involved.

Attendees of AvKiwi Safety Seminar 2017, "*Fuel For Thought*" were confronted with a worrying statistic – 40 per cent of engine failures are caused by fuel exhaustion, starvation, or contamination.

Of that 40 per cent, starvation occurrences are the most common. The fact that the majority of those likely resulted from pilot error illustrates the need to improve pre-planning, inflight fuel monitoring, and aircraft knowledge.

Almost 1900 people at 32 seminars from Invercargill to Kerikeri have received a masterclass on fuelling considerations, while also gaining early access to an app we believe is a world first.

Each section of the safety seminar was illustrated by an occurrence from the CAA files. We've provided snippets from the case study on contamination, but you also need to check out the *Fuel for Thought* online course at www.caa.govt.nz/avkiwi. It's loaded with facts and videos from folk who have volunteered their stories so that you can benefit from their experience.

Contamination

When asked to give examples of fuel contamination, AvKiwi crowds often responded first and foremost with "water".

The following account, involving CAA Flight Examiner, Marc Brogan, shows that contamination isn't always that straight forward.

"Around May 2005," begins Marc, "a young CPL student decided to lease an aircraft from down south to build his CPL hours.

"When he and a PPL mate picked up the aeroplane, they were told that at lower altitudes, the aircraft could run rough. If that happened, they were to just lean it out. Apparently that was the approved 'fix'.

"They headed for home, and on the way found that the aircraft was no well-oiled machine.

"The two pilots stopped for fuel and did a bit of a logic check on what was wrong. A local engineer assured them it was carb icing, as did a senior instructor at the aero club where they had also stopped."

They eventually reached home base without further drama, and a day or so later, the CPL student suggested to Marc, that the two of them go for a fly.

"Sure enough, at low level, approximately 1500 feet, it needed to be leaned out," continues Marc.

"But it seemed to perform fine and there were no further issues. We did what we needed to then headed back to the aerodrome. On arriving back we decided to do a touch and go, but passing 200 feet after climbing out, the engine started to run alarmingly roughly."

As there were very light winds and no traffic, Marc called the tower and requested they be allowed a dumbbell turn, landing back on the runway.

After a safe landing, Marc committed the machine to a thorough inspection before any more flying was done.

The duty engineers stripped the engine down. A piece of hose clamp 4.3 cm long was lodged in the carburettor throat, meaning there wasn't enough air getting in, hence the need to lean the mixture out.

There was no logical explanation as to how it had got there but it had obviously been there for a significant period of time to cause that rough running.

This hose clamp was found lodged in a carburettor throat, giving new meaning to the words, 'fuel contamination'.

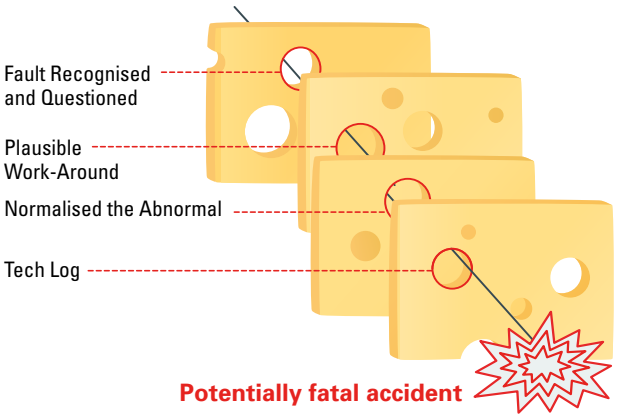
Lessons

The main lesson from this occurrence surrounds the danger of normalising the abnormal, and over a period of time, developing a 'she'll be right' attitude.

"Over a period of time," says Marc, "this organisation got used to the fact that this engine was running rough. They'd never thought why it might be running rough, they just came up with an immediate solution which was quite a long way from normal practice. That risk then shifted onto the next operator using the machine.

"When we found out what was wrong, it was something that could have been remedied quite quickly with the correct technical knowledge – just thinking about it logically."

The Swiss Cheese Model



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

Fault Recognised and Questioned?

Was this fault ever properly recognised as a reportable fault or even a fuel issue? It doesn't seem so.

Work-Around Plausible?

The work-around seemed reasonable and plausible, and was implemented without too many questions being raised. It also seemed to fix the problem.

We all use work-arounds, such as knowing the aerodrome gate sticks and you 'need to lift it when you open it'. But when the work-arounds concern the primary systems of your aircraft, they deserve more thought:

» Why is a work-around needed?

» Who suggested the work-around?

» How long has it been in place?

» How long is it planned to be in place?

» Is there any remaining risk?

Normalised the Abnormal

This fault became normal. It was simply accepted that in this aeroplane the pilot needed to lean the mixture at 1500 feet, and then everything was fine.

Tech Log

If this defect had been entered in the Tech Log, the fault would have been investigated, isolated, and rectified, removing the risk. ■

"You Could Well have Saved Someone's Bacon"

One of the key lessons promoted in *Fuel For Thought* was to know your dipstick.

A pilot who attended the seminar wrote in with his feedback.

"You will be happy to know that our dipstick was recalibrated and found to be eight litres out (on one side). That's nearly 24 per cent. I couldn't believe it. You could well have saved someone's bacon!"

The dipstick has now been engraved with useable fuel and the aircraft registration. Most importantly, it reads accurately.

Know Your Aircraft App

To help you understand more about the fuel system in your aircraft, we've created the ***Know Your Aircraft*** app. You might think you know your aircraft, but when you begin to work through a series of questions, helping you build a mental picture of your fuel system, it can be surprising to find out how much you rely on the aircraft's flight manual to fill in the blanks.

Using the user-friendly drag and drop tool, you will be able to build a schematic picture which you can print out and email to yourself, and others who might be using your aircraft.

The app allows pilots to collect, understand, and retain data on all of their aircraft's fuel-based needs, ranging from how many fuel tanks and vents the aircraft has, to how much fuel is required to climb to a certain height.

It's also handy for those who are undertaking a new type rating, ensuring their knowledge is sufficient for any situation.

Give it a try and if you have any feedback, let us know. It's available, free, on the Apple App Store and Google Play. This is a planning tool and not available to download on your phone. It is for tablets (including iPad) only.

A Study **in Safety**

A whiteboard exercise in Miramar was a catalyst for a highly successful – and safe – event amid the peaks of the Crown Range and Southern Alps. Here, a case study in ensuring safety at an aviation rally.

The New Zealand Association of Women in Aviation (NZAWA) has held a three-day rally during each Queen's Birthday or Labour Day weekend since 1960.

With that longevity, the organisation decided that, prior to its 2017 event in Wanaka, it needed to take a fresh look at safety.

"We don't officially have to have a formal Safety Management System (SMS)," says Sue Telford, who organised this year's event.

"But with the focus these days on SMS, and the new health and safety laws, we felt we had to raise our game.

"We set out to communicate more widely and more effectively, to have a more streamlined competition structure, and to put in place enhanced airside safety."

Sue was reaching out to allies of the event a full year before it was to be held.

"Communication was key," she says. "Very early in the process I was talking with Wanaka Airport's manager, Queenstown Airport Corporation.

"They wanted a safety management plan for the event, including a hazard sheet and what systems we were putting in place to manage the risk presented by those hazards. That was a good exercise for me, to be thinking early about any hazards associated with the event."

Sue says the administrator of the airfield where such an event is to be held, needs to be brought on board early.

"Especially in terms of their SMS. It's good to work with them on that. And you don't take it all on yourself – it's really important to delegate."

She also met and briefed the Wanaka Airport management team, who in turn briefed the user group about what they could expect during the rally.

A smoothly running event is a safe event. A more organised and condensed grid competition reduced the risk of an incident.

"In response, I was contacted by the parachuting company, Wanaka Skydive, and between us, we worked out how we could both use the dual runways at Wanaka safely and efficiently. That demonstrated the success of an established user group within an airport community."

"Being careful to identify hazards, and mitigate their associated risks does not mean fun is sacrificed."

Elsewhere, a keen group from the NZAWA gathered in the Wellington suburb of Miramar in May 2017, to attend a CAA-sponsored seminar created specifically for them.

Included in the day was a whiteboard brainstorming session, led by CAA Aviation Safety Adviser, Carlton Campbell, on every threat to safety they could come up with, and its associated mitigation.

Some items were threats to the event no matter where it was held, and some were peculiar to Wanaka: for instance, the possible conflict with the parachuting operations there.

"What I found really pleasing," says Jeanette Lusty, CAA team leader of sport and recreational flying, and long-time member of the NZAWA, "is that the organisers were so open to different ways of approaching safety, even though the event had been going for so long without real incident.

"The particular issue the airwomen have is that each year, the site of the event changes. So every Queen's Birthday weekend brings new topography, new weather conditions, new aircraft, new people organising it. On top of that, the event is run by

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Photo courtesy Steve Worley / Wanaka Imaging Ltd

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people who don't have a specific 'home'. They often don't see each other from one year's rally to the next.

"These are all special challenges that your average aero club doesn't have to worry about when they run competitions."

"As it turned out," says Julie Bubb, the NZAWA president, "some of the things we anticipated did not eventuate. For example, early morning ice on the wings. The frost hit the day after competitions finished, but mitigations were in place should ice have been a problem."

The most obvious of the new safety initiatives was the use of a handful of Air Training Corp (ATC) cadets.

"They marshalled people on to the apron, oversaw competitions, and acted as 'gophers'. They were just fantastic," says organiser Sue Telford.

The main job of the cadets was to escort all competitors and judges airside.

"One of the problems we've been increasingly aware of," says Julie Bubb, "is people wandering around airside. We knew it was a safety issue, and the use of the cadets minimised the risk."

"Your ATC or St John cadet is the perfect person to get involved in these sorts of events because they like the flying gigs," says Sue.

"Again, we had good early communication with the local ATC. They knew they were needed for this date, so their leader put in place a course of study on safety management. Then the cadets were able to practise that programme at the actual event. It was great foresight on the part of the ATC.

"Some of the cadets were only 13, but they were very mature, very capable. We told them, 'you have to wear your high visibility vest, you don't let *anyone* through the gate to go by themselves to the aircraft'.

"It all worked really well, and I think it was also good for the cadets to see how seriously we were taking safety. They will hopefully take that culture on for themselves."

Sue says everyone today is more aware of their personal responsibility for safety.

"We had a stack of high-vis vests from the airport manager to distribute. But, oh my goodness, it was astonishing how many people now have their own!"

A smoothly running event is a safe event. Carlton Campbell says a more organised and condensed grid competition also enhanced safety.

"When you've got aircraft trying to make a precision or forced landing, the pilot is focused on being very accurate. When you've got other traffic in the same area, it can distract the competition pilots, and that obviously heightens the risk of an incident, or worse.

"So making sure those competitions were out of the way in the morning lessened the chances of having aircraft competing for the same bit of runway."

Carlton says clear, methodical briefings for both judges and pilots are essential, particularly for those who are not local.

"A checklist of items should be gone through systematically and formally so that everyone taking part is quite clear about what will happen and what they are expected to do.

"The briefings also need to be free of time constraints. While it's important to event organisers to keep to schedule, that should not be at the expense of a thorough and coherent briefing."

Sue Telford said a 'run sheet' also helped to streamline the event and improve safety.

"It accounted for every hour's activity from Thursday to mid-Monday afternoon – what needs to be done now, what needs to be done next.

"When things are so well organised, safety can only be enhanced. For us that was particularly so on the Saturday, which is the important day of the rally. Everyone wants to compete, and you need to run the ship on that day fairly uninterrupted.

"So you have all your prior communications done months before, and you've got your marshals in place, your executive, management and organising committee fully informed. Then that run sheet gathers up what's been discussed, what's been put in place, and what needs to be chased after.

"It's definitely part of safety management. Because you're tired! And you can forget things, and if you don't have something to refer to, you run the risk of not having something essential in place."

A formal debrief about what worked, and what didn't, including safety measures, is following the 2017 event. It will be more analytical than in previous years.

"One of the things we can still improve on," says Julie Bubb, "is providing our competition organiser with a second-in-charge. The organiser this year was really pressured, and in future years, we'll remove some of that burden by having someone to help her. That will also enhance safety."

Sue Telford says everything new learned at Wanaka about safety is now officially templated so future event organisers can follow the routine. That 'kit' is online so it can be easily accessed.

"And we'll see how flexible it is. Next year the rally is at Whitianga, which is a totally different environment from Wanaka.

"So while some of those templates will be useful for Whitianga, we will need to go back to the whiteboard, and look at the special challenges staging the event there will bring."

Jeanette Lusty says the success of the rally showed that safety can be taken seriously without compromising fun.

"We don't want to get so nit-picky that it all becomes too difficult. People will just back off, saying 'it's too hard, I won't do it'. And of course that defeats the purpose.

"But they really raised their game this year, and it seems like everyone also had a great time. So being careful to identify hazards, and mitigate their associated risks does not mean fun is sacrificed." ■

The OUTs and INs **of ADS-B**

Do you fly in controlled airspace? If so, you're going to be affected by the introduction of ADS-B OUT. We put some of your questions to the CAA's ADS-B specialist, Clayton Hughes.

The CAA is proposing that ADS-B OUT be mandatory in controlled airspace for aircraft above FL 245 by the end of 2018, and by the end of 2021 for aircraft below FL 245.

Using a combination of satellites, transponders and Global Navigation Satellite System (GNSS) receivers, ADS-B involves aircraft self-reporting their GNSS-derived position. It will replace current radar surveillance.

***Vector*: Clayton, how do people know if they need to equip?**

Clayton: If they want to fly in controlled airspace beyond the mandatory dates, they'll need ADS-B.

In the past, the accuracy of the position of aircraft was controlled by the Airways system, but each individual aircraft will now be responsible for the integrity of their position.

This could lead to greater efficiency of airspace management, which will benefit all operators.

V: What sort of equipment will operators need?

C: People will need a compliant 1090 MHz Mode S extended squitter transponder, and a compatible GPS position source. This can be a separate GPS, integrated with the transponder, or an all-in-one transponder with GPS.

The biggest issue is ensuring the transponder and GPS are compatible with each other.

Existing equipment certified to older standards can be used, but newly installed equipment must be TSO-C166b certified.

The Notice of Proposed Rule Making (NPRM) for ADS-B above FL 245 will be out soon, which will give guidance on equipment and installation.

Even if you only fly below FL 245, make sure you read that NPRM, because the equipment requirements will apply to you if you want to fit ADS-B before the mandatory date.

V: What about the cost of equipment?

C: There is a cost factor, just as there was when transponders were first introduced. There is a range of options available now, including the all-in-one transponders, which can save money and time in both integration and installation. We recommend discussing this with your avionics supplier.

V: Can uncertified equipment be used?

C: The CAA is looking at conducting a trial to see if uncertified equipment has the required position integrity, and is compatible with the New Zealand system.

V: What about ADS-B IN?

C: ADS-B IN adds a receiver that allows people to see the location of aircraft transmitting ADS-B OUT signals. There are apps available that allow people to track ADS-B, but they should not be used as they may not be in real time.

There are no plans to require ADS-B IN in New Zealand, but there are benefits to it. I'd encourage people to learn more about it.

V: Are there any common misconceptions?

C: Some think the GPS in their IFR aircraft has to be hooked up to the transponder. That's not the case, as the GPS used for ADS-B can be a separate unit, or included in an all-in-one transponder. Just be aware that the GPS receivers in the all-in-one ADS-B units can't also be used for navigation.

V: Are there ongoing checks to ensure equipment remains calibrated and functional?

C: Most people are already used to maintaining and operating transponders, and there's no real difference for ADS-B.

The 24-month transponder check requirement will still apply, and ADS-B will need to be run through a test set as would a Mode S transponder. There are ADS-B upgrades available for some existing test sets to ensure they're compatible.

V: What if people need more information?

C: I'd say have a chat to your local avionics supplier, or email me, clayton.hughes@caa.govt.nz.

There's also a set of frequently asked questions on the New Southern Sky web site at www.nss.govt.nz/the-plan/surveillance. ■

Surviving 'Engine Out' in a Helicopter

It's the scenario nobody likes to think will happen to them. But if it does, a clear head makes all the difference.

There was a spike in the number of helicopter power loss occurrences in the first quarter of 2017, with seven reported.

There wasn't a common thread found across the occurrences, but we saw the jump in numbers as an opportunity to describe the experience of one of those seven pilots whose power suddenly failed.

Founder of Alpine Springs Helicopters, Bill Hales – a pilot with more than 40 years experience – found himself facing an emergency landing when his Hughes 500 suddenly lost power during a hunting flight at Graf Creek in the Southern Alps.

"We were on a normal cruise around the bush edge when I heard an abnormal noise, which was the 'engine out' warning. I remember having another look at the dash, and it took a split second to work out we really were losing the engine," said Bill.

It's moments like these that truly test a pilot, and Bill attributes his rapid response to both instinct, and training.

"Quickly establishing what had gone wrong was the key to it. As soon as I saw the engine out light and the rotor RPM dropping, I put the collective lever through the floor and was trying to get it away from the hill."

In the twenty seconds it took to bring the helicopter down, Bill had the presence of mind to activate the ELT beacon.

"As we were going down, I had the thought that this was going to hurt. It's good to know where the ELT button is, because if we'd been injured we at least knew we had turned the beacon on," he said.

Photo: istockphoto.com/portfolio/sierrarat

This wasn't the first time Bill had experienced a major mechanical failure mid-flight.

"Two years ago we had a brand new transmission blow to pieces, and the steps were the same. We identified what went wrong, but in the case of a transmission failure you don't put the lever to the bottom. We flew the aircraft to the ground, having found a road to land it on."

Back to Graf Creek, and he was looking for a place to set down.

"They say people should be doing a lot of things during an autorotation, but my head was out the door trying to figure out where to put the aircraft. I never had time to get up to 60 knots, but I slammed the lever down and kept what airspeed I had."

He emphasised that there was no panic in the cabin. Bill simply advised his passenger, shooter Mickey Broadhurst, that the aircraft was coming down, before setting to work.

"The words of veteran Hughes 500 pilot Mel Cain were going through my head. He said that if you were ever going to put it down in a difficult spot, make sure you don't have any forward speed.

"We were lucky as we skimmed the moss off the top of a big rock on the way in and landed slightly forward on rough scrubby ground with another big rock under the belly. It sat there, without ever putting a mark on the machine. We landed so gently, you wouldn't have spilled a glass of water in your hand," he said.

"All the systems worked, the ELT was going, we put her down and we activated Spidertracks. The rescue helicopter was on its way; everything was on the move within ten minutes of landing."

A clear head, good experience, and good training saw a positive outcome.

"The big thing was not panicking. The key was to 'fly the bloody aircraft'. Even without an engine you can still fly it," said Bill.

After a fractured P3 air pressure signal line was replaced the following day, the 500 was fit to fly again and Bill returned to work.

"There were no great heroes out of this, it was just a good outcome from a bad spot." ■

Introducing **Anna Adams**

This public law specialist has joined the five-member Board of the CAA.

Anna Adams brings 20 years of health and safety, law of government, regulatory, and governance expertise to the CAA.

As a lawyer, Anna has represented both regulators and the communities they regulate, including in reviews and inquiries, prosecutions, and in policy development.

"I've also worked extensively with the health sector, which has quite a technical professional aspect to it. Both the aviation and health sectors are very safety-focussed and are heavily regulated.

"It's helped me as a lawyer to witness the 'coalface' impact of public health and safety initiatives, for instance, in public hospitals. I hope that experience will be helpful to the CAA Board as it develops strategies to enable the good functioning of the civil aviation system."

Chairing the board of Meredith Connell, an Auckland firm of 140 lawyers, whet Anna's appetite for work in governance.

"Just over half of the lawyers at Meredith Connell are women, and about a quarter of those are partners. I was interested in getting involved in governance in the public sector, partly to promote gender diversity. I have found it promotes a better exchange of ideas around the board table."

Anna sees the challenges currently facing the CAA as often involving a balancing act, ensuring public safety while not being any form of handbrake on innovation.

"The CAA is also having to weigh the needs of traditional aviation participants, and the needs of its rapidly growing non-traditional constituency of drone users."

"Dealing with risks of terrorism in aviation is another complex balancing act because it necessarily involves intrusion on people's freedom of movement, and economic productivity."

"So those are all challenges. But I think they're interesting challenges to have!" ■

No **Old Turkeys**

When CAA analyst Joe Dewar stands in front of an aviation audience, he often recounts a story of the turkey living on an American farm, in the lead up to Thanksgiving Day. The story illustrates how blind we can all be to risk.

Joe bases his account on the book *Antifragile* by essayist Nassim Nicholas Taleb.

In it, Taleb describes the turkey fed each day for a thousand days by a butcher. The evidence before the turkey is that the butcher is benign, life is good and without threat.

The turkey falls into the "soothing predictability of life" and grows fat with regular meals and complacency.

Then comes the day before Thanksgiving.

What Can Possibly Go Wrong?

Obviously, the turkey's mistake was assessing the degree of risk in his life by basing it on past 'evidence' – the past was secure and therefore the future will be too.

What the turkey should have been curious about, according to Joe Dewar, is why there were no old turkeys on the farm.

Joe tells the story to demonstrate how easy it is to slip into the belief that because nothing has gone wrong yet, nothing will go wrong ever.

As Taleb writes, "…mistaking the absence of evidence (of harm) for evidence of absence of risk is a mistake".

Absence of Evidence

The human brain is tuned to respond to uniqueness, and a repeated action ceases to provide stimulation. What was once novel becomes second nature.

That does have a positive payoff, as CAA's Principal Aviation Examiner, Bill MacGregor, explains.

"When a pilot is learning to hover a helicopter, trying to maintain a steady point in three dimensional space initially seems impossible. But soon the physical motor skills develop and become refined, freeing up mental capacity for thoughts such as, 'Where am I? What's that strange noise? What happens if…?'"

So repetition initially helps the pilot's brain learn, then allows it to attend to other important stimuli.

But it's a fine line between that, and unthinking complacency that links past evidence that it's always been okay, with the conclusion that it will therefore be okay again, today.

CAA Aviation Safety Adviser, Carlton Campbell, describes the pilots most at risk of that.

"Complacency can affect pilots who fly routine days, particularly if they're doing repetitive short-leg flights. Or operating in a comfort zone of flying the same aircraft, on the same route, on the same day each week."

Aviation participants who are uncritically satisfied with the smoothness of their day can begin to make small mistakes: not checking the apron at a quiet aerodrome and pulling out in front of another aircraft, or taxiing in with landing lights on, flaps still down and transponder still on. Or leaving a nut loose. Or not pricing the job properly.

"Complacency can affect pilots who fly routine days, particularly if they're doing repetitive short-leg flights."

Becoming an Old Turkey

Everyone has turkey moments, when assurance tips over into smug belief that all will be well. And then there's an incident.

Small mistakes should be seen by those making them as an opportunity to review their procedures, because they've stopped asking themselves important questions.

A pilot recently spoke to *Vector* of his turkey moment.

"Some years ago, I was coming into land in a Cessna 172 at an aerodrome I still use regularly. On the runway was a Fokker Friendship F27, a turboprop airliner. I heard the tower give the Fokker F27 permission to take off, but he just kind of sat there.

"I kept thinking, 'he'll go soon… he'll go soon…' and all the while I'm getting nearer and nearer. But I was doing only 70 kts so I thought I'd never catch up with him."

When the Cessna was down to approximately 200 ft, the Fokker finally began to roll down the runway, and as the Cessna flared for landing it was hit by the propeller slipstream. The plane and pilot were badly buffeted and were lucky not to be flipped over.

"I sat there stunned, waiting for the tower to give me a talking to. But I think they were as stunned as I was.

"What was I thinking? I'd landed at that runway hundreds of times; I knew the aircraft inside and out.

"But that was the problem. It was all so familiar, I didn't consider prop wash. I just didn't switch on my brain.

"But it taught me that I was complacent. And that I had to fight against that.

"Before that incident, I was so complacent, I wasn't even aware that complacency might be a problem."

From Turkeys to Swans (Black)

If complacency is dangerous, unpredictability is more so.

Nassim Nicholas Taleb calls unexpected events 'black swans'. Such events are virtually impossible to see coming, but they will make the most of any systemic – or human – weakness, with catastrophic results.

In an occurrence already described in *Vector* (September/October 2015), a Piper Arrow heading east out of Christchurch encountered a black swan. Flying over sea and ascending, the aircraft's engine suddenly lost power.

The experience and cockpit teamwork of the trio on board got them safely back on the ground, but the occurrence was exactly what is meant by a black swan.

So how to anticipate such an event, which is so tough to foresee?

The specialists' advice is, firstly, to always accept the possibility of such a random event.

Then strengthen systems, and prepare and plan appropriately.

Carlton Campbell says the pre-flight routine is crucial for such planning.

"If a pilot is flying, particularly in a foreseeable and familiar pattern, it's easy to become overly confident with the preflight. But that mind-set of 'it was fine a few hours ago, it will be fine now' can be really dangerous."

Beyond a thorough preflight, Bill MacGregor says nothing beats having a plan. And a plan B.

"Check the weather, NOTAMs, and AIP Supps, mark up the map with appropriate prompts, and submit a flight plan.

"Then look outside the norm and plan for the unlikely. Think about possible emergency landing areas and diversion fields, about life jackets, a life raft, and other emergency equipment.

"Try to prepare for all contingencies. If the worst should happen, at least you have what you need, to respond the best way you can." ■

Photo: istockphoto.com/portfolio/bazilfoto

Amending SARTIME, **Term**

Forgetful pilots have been tracked down to aero club bars; returning their aircraft to the hangar; and driving down the highway. Why it's important to remember the adage: the flight isn't complete until the flight plan is terminated.

On 16 March 2017, staff at the Lower Hutt-based Rescue Coordination Centre (RCCNZ) were stretched and under pressure.

A cruise ship passenger had been reported as falling overboard and was missing. A person with spinal injuries needed to be rescued from the Nelson Lakes National Park. And three Search and Rescue (SAR) watches were reported as unterminated.

The first unterminated SARWATCH turned out to be the result of the pilot forgetting to cancel their flight plan.

So was the second.

And the third.

Since no event is assumed to be a false alarm, there's considerable energy and cost expended by both the RCCNZ and Airways when a SARTIME expires, with no word from the pilot.

And it's not a rare occurrence.

Airways says it deals with about one such situation a day, and between six and seven per cent of all monthly alerts turn out to be the result of forgetful pilots.

You need to be aware that not cancelling a SARTIME potentially carries a fine of between $2,000 and $5,000.

RCCNZ Watch Leader and Senior Search and Rescue Officer, Neville Blakemore, says pilots on a VFR flight plan need to terminate their flight plan, advising the Air Traffic Service by cellphone, online, or by radio.

"Ideally, pilots should terminate a flight plan, or amend it, at least 15 minutes before the expiry of the nominated SARTIME. Virtually everyone has a cellphone, so it's never been easier."

If a pilot is unable to use a radio to contact FISCOM to amend or terminate their SARTIME, the phone number to call if using a cellphone is either 03 358 1509 or 0900 62 675.

The landline number to terminate their flight plan is 0800 NBO PLN (0800 626 756).

How to Use Flight Plans

A pilot must file a VFR flight plan if they want an alerting service – or SARWATCH – provided during their flight.

The VFR flight plan will include the pilot's SARTIME, which is the time they are to call Airways by, when they have landed safely.

Airways' Air Traffic Support Sector (ATSS) Deputy Team Leader, Kevin Holland, says far too many pilots fail to give themselves sufficient time to complete a journey.

"Then, finding they are going to go beyond their original flight time, they compound the problem by failing to ask ATSS to update their SARTIME accordingly.

"Unfortunately, the most common excuse we hear from 'overdue' pilots is that they forgot to amend their SARTIME or cancel their flight plan."

So What Happens When a Flight Plan is Not Terminated?

When a pilot's SARTIME expires without them making contact, the ATSS electronic system highlights the flight information on screen and sounds an alarm.

ATSS staff take initial steps to locate the aircraft by calling the tower at the pilot's destination airfield, asking if the aeroplane has, in fact, landed.

If not, ATSS contacts attended aerodromes along the flight plan route, to establish if the pilot has diverted there, or made an unscheduled landing.

If the aircraft remains unfound, the Airways' flight information officer radios the pilot, and if necessary, makes a general call on all frequencies to any pilots to determine if the aircraft has been seen, or spoken with.

Staff also continue to try to contact the pilot by cellphone. If there's been no contact in 15 minutes, Airways notifies the RCCNZ.

"Unfortunately, the most common excuse we hear from 'overdue' pilots is that they forgot to amend their SARTIME or cancel their flight plan."

Rescue coordination staff go into a formal 'alert phase' during which the route and contact details the pilot has provided in their flight plan is used to prepare a search.

Airways' Kevin Holland says pilots who regularly report where they are during their flight, are found more quickly.

"If pilots regularly gave position reports or updated their route – especially in the case of planned training diversions – Airways and RCCNZ obviously have a more accurate idea

inating Flight Plans

of their location. That can save a lot of time when it's needed most."

If, after an additional 30 minutes, there's still no contact with the pilot, RCCNZ increases the alert level. Other aircraft may be assigned to fly the route detailed in the flight plan, and emergency services could be notified.

From this point, RCCNZ treats the event as a full scale rescue operation…

What's In It For You

Every pilot should appreciate the value of filing a flight plan. The SARTIME service incorporated in it means that if the worst should happen, a search kicks into action the *moment* your aircraft is overdue.

But so as not to sabotage your own excellent decision to file a flight plan, remember to terminate it.

If you think you might forget, try leaving something novel in your car to remind you before you head home – a note on coloured paper on your car seat, or in the cockpit – or a reminder on your phone or iPad.

It will potentially save the country money and valuable resources. Also, your own embarrassment when the country's search and rescue officials track you down to your local café, sipping your post-flight latte. ■

Photo: Courtesy of Wanaka Search and Rescue, Incident Management Team.

The incident management team of Wanaka Search and Rescue works with the police and the NZRCC to co-ordinate, direct and manage search operations in their district.

Murky Flying

Hasty decision making based on limited information had this pilot at the mercy of deteriorating weather, lowering cloud, and diminishing safe landing options. All with fare-paying passengers on board.

I'd been bouncing around the local area quite a bit that day. Seven short-hop flights – some as short as 12 to 15 minutes – most with fare-paying passengers, and all without incident.

The weather all morning was on the lower end of ideal, but still legal. Cloud base was broken at about 1200 ft, visibility was 10 to 15 kms, the sea we were flying over was glassy, and there was plenty of fuel on board for each journey.

So far, so good.

The day got busier. There were quick turnarounds between flights, with passengers getting off and on, bags being loaded, bags being taken off, and refuelling.

The responsibility for these fell largely to me. Which was fine, but in the increasingly short amount of time available to me between flights, it felt like something had to give. I chose possibly the worst time to skimp on properly checking the weather.

I'd done the big check of forecasts at the beginning of the day: TAFs, ARFORs, rain radars, terminal weather information, METARs and ATIS info. I felt like I had a pretty good idea of what was coming at us.

There were some showers in the wider region, but they were moving around, and isolated.

A good portion of our job as air transport pilots is managing less than ideal weather to get the job done, and sticking to schedule. So I was moving fast, not mucking around; but still on the right side of safety and the rules.

But as time got shorter between flights, I began to prioritise my forecast checks. Since I believed that most of the information on the ARFOR was not relevant to me for that day's flying, I began to concentrate only on what weather conditions were expected in the next hour or so, and around my intended routes – mainly the rain radar and ATIS.

That'd got me through the morning and I guess I felt the same trimmed-down weather checks would get me through the afternoon.

I'd been watching a rain band approach my destination airports during the morning. But without checking the 'bigger picture' information – the ARFOR and other aerodrome weather – what was coming and when it was due, did not match what was in my head.

Two passengers climbed aboard for the 12:50 flight, and after checking the rain radar, I made some quick calculations of when I thought that rain would arrive at our destination airport.

I worked out that if we left 15 minutes early we should be there in plenty of time.

We took off in conditions similar to what I'd experienced all day, and with good visibility of about 25 kms.

But about three quarters of the way into the flight, I observed a large shower pass over the city and I decided to hold.

We had lowering cloud which at times forced me to descend as low as 500 to 600 feet AMSL to stay clear of it and remain in VMC.

I explained to the passengers that we were holding while I waited to see what the weather would do. I had a stopwatch going on my phone, because I had calculated how long I could hold, fuel-wise, before trying for an alternate airfield.

Fortunately, we had light passenger loads, and I could uplift much more fuel than might otherwise be the case. We had just over two hours fuel on board (twice as much as usual for the route). That was made up of 'A to B' fuel, plus legal reserve, then another hour's worth – part of our company's specs – and finally another 15 minutes contingency.

The weather at the destination had by now got down to below VFR minima. We held, in all, for about 20 minutes. In that time I was speaking to the air traffic controller at the destination tower, and other pilots – who were still getting into the airport under IFR – getting updates on the conditions there.

At that time I was also talking to home base about alternate airports, but unfortunately they too were getting clagged in.

After about 15 minutes of holding, the tower told me the weather appeared to be clearing out to the west.

I decided to head in that direction, but it went from what had been average conditions to bucketing down in a matter of seconds.

Realising those conditions would not let us through, I decided it was time to head back to our original departure point.

But about that time the tower said the cloud over the destination airport was lifting. They would try to bring me in along some natural features, and under a special VFR clearance.

In the end, the landing went without a hitch.

But folks, I stuffed up. I departed without first checking all the latest weather information available to me. I then flew into deteriorating weather conditions enroute – conditions that I would have known about had I only taken the care to check.

That then led to other problems. While I was holding, despite circling tightly to try to stay over the water, I ended up flying below the legal height over a built-up area.

Looking back, I should have returned to the departure point as soon as the weather closed in. Instead I waited, because I wanted to complete the journey for my passengers' sake.

Not my best day of flying. But you learn.

No matter how busy you get, no matter what self-imposed pressures you feel to do a good job, it's not worth doing a once-over-lightly on those weather checks – particularly when you know that the weather is approaching minima.

I now have a more 'ritualistic' approach to the way that I check the weather, especially if it's starting to look marginal. I've learned that it doesn't take a huge change for the weather to go from marginal to unsafe.

So you need to take that time to stop, delay what you're doing, and get that holistic picture. Check on updated TAFs, updated ARFORs, also looking at ATISs and METARs from aerodromes that you're *not* intending to fly to. That's because something like the front you were expecting to arrive later in the afternoon, may already be passing through another airport. Now you can see, 'well if this is what the weather is like at that place, this is what I'm probably going to expect where I'm going'.

It's about being systematic, 'this is the way I'm going to do it, every flight, and I'm going to get that holistic picture of what's going on'.

"It's also absolutely about having the confidence and self-esteem, even given the self-imposed pressure to do a good job, to say: 'Actually I'm not going to fly this one.'"

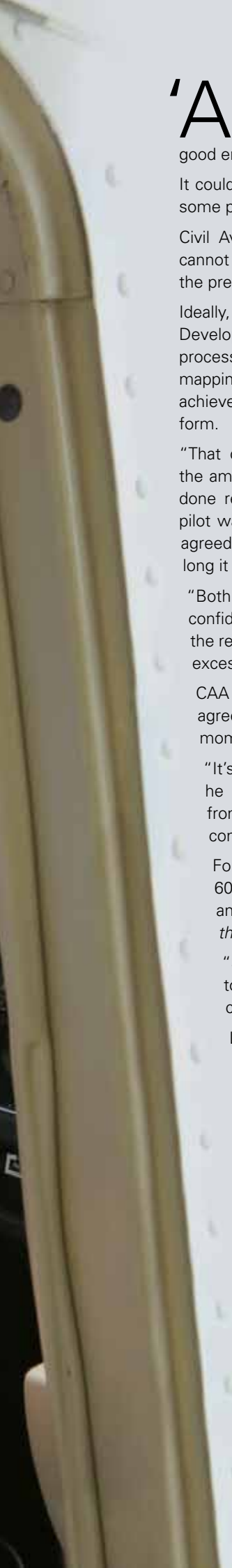
The CAA Comments

The CAA commends this pilot for sharing their experience so that others may learn from it.

In addition to the pilot's advice, the CAA provides the following safety messages:

- Use all resources available to prepare for a flight, including NOTAMs at www.ifis.airways.co.nz, and weather information at metflight.metra.co.nz.
- Don't continue into bad weather – hold in clear air or divert.
- Demonstrate safety leadership – maintain high standards at all times and encourage the same from others. ■

BFR – Not a Test but an Opportunity



'Amiable mediocrity' is a term coined by the American writer John Gardner, to describe a sort of benign 'close enough is good enough' attitude.

It could also be used to describe the attitude of some pilots to their biennial flight review (BFR).

Civil Aviation Rules mandate the BFR: a pilot cannot legally fly without having passed one in the previous two years (rule 61.39).

Ideally, says CAA's Training Standards Development Officer, David Harrison, the BFR process should start with the instructor and pilot mapping out what the review is seeking to achieve, beyond the tick boxes on the review form.

"That conversation should address things like the amount and type of flying that the pilot has done recently, and any specific areas that the pilot wants to look at. From this, a plan can be agreed for the conduct of the review and how long it should take.

"Both parties should walk away from the BFR, confident that the pilot is performing to at least the required standard, and ideally, something in excess of that."

CAA Aviation Safety Adviser Carlton Campbell agrees the BFR should be seen as a 'learning moment'.

"It's easy to aspire to averageness," he says. "But the real satisfaction comes from extending flying skills, becoming competent in areas previously beyond you."

For instance, wind shift plays a role in almost 60 per cent of all weather-related accidents, and Carlton says more than 60 per cent of *those* accidents occur during landing.

"So pilots should embrace the requirement to do crosswind circuits, to improve their competence and currency in that area."

Long time instructor, Bill Henwood, says he sends away pilots who want only a box-ticking review.

"This is a golden opportunity for them to improve, extend, boost and correct their flying skills, possibly the only chance recreational pilots might get to do that.

"I can't be bothered with pilots who just want to chug along, get the thing over and done with as quickly, and as quietly, as possible. They completely ignore the opportunity to learn to fly better."

While Bill Henwood believes there are instructors who will oblige such 'lazy' pilots by ticking off their minimal abilities, he believes the number of pilots wanting more from their BFR is increasing.

"Both parties should walk away from the BFR, confident that the pilot is performing to at least the required standard, and ideally something in excess of that."

"They're demanding more from their instructor in terms of learning new things. In turn the instructor has to be open to doing more than just ticking some boxes, and moving on.

"Likewise, if the pilot doesn't suggest something, a good instructor will do so, encouraging them to develop their flying in some new direction."

Carlton Campbell says one way more established pilots can improve their skills is to ask for some mountain flying practice.

"BFRs these days require mountain flying skills, but that is not retrospective for pilots who got their licences before mountain flying became a compulsory test.

"But given New Zealand's mountainous topography, flying skills in such areas allows the pilot to experience far more of their passion.

"Also, even if a pilot limits themselves to a particular area, fearful to go anywhere else because it involves more highly evolved flying skills, I'd remind them that their licence allows them to exercise privileges *nationally*."

Bill Henwood agrees. "What if one day they're joined by a friend who might want to go somewhere new? Or family circumstances means they need to fly outside their literal comfort zone?

"They should be able to embrace such situations with anticipation and joy, not dread and anxiety."

One of Bill's clients is Michael Wood. A PPL holder since 2005, Mike flies with New Zealand Warbirds in a T6 Harvard, and a DHC-1 Chipmunk.

"I always enjoy the BFR because it's a really good chance to brush up on some of those skills and exercises you wouldn't necessarily go and do yourself.

"It's great to do all the forced landings, stalls, low – and slow – flying you don't tend to do as part of your normal weekend flying.

"I guess I just enjoy being put through the mill to make sure I can still do everything okay – that's the challenge for me.

"I don't understand people looking for the box tick. You've got to keep yourself challenged and make sure your skill levels are right up there."

Mike also has no time for the opinion of some, that instructors invite pilots to have extension training as a money-generating exercise.

"In an extra 30 or 40 minutes you can get in a couple of forced landings and a bit of low flying. It's not going to cost that much more to get those skills in, as long as you don't have to fly miles to do it.

"If you can afford two hours flying, you can afford two and a half hours to become a better pilot." ■

Engineering Support

A recent restructure at the Civil Aviation Authority has made it easier to get answers to your engineering questions.

The CAA's new Airworthiness Unit is an amalgamation of the old Aircraft Certification Unit and the Maintenance Team.

The Manager of Airworthiness, Shaun Johnson, says the restructure will ensure consistency of advice.

"We have a rapidly changing aviation environment and this amalgamation was seen as an opportunity to refocus our resources, and to ensure that we've got some central points of contact for industry."

There are three teams that make up the new Airworthiness Unit.

The Continuing Airworthiness team is led by Warren Hadfield. Its responsibilities include oversight of Part 145 Maintenance Organisations, and Air Transport Operator Maintenance Control Organisations.

It includes a new position, Senior Technical Specialist – Maintenance Programmes, whose role ensures consistency across the CAA.

The Product Certification team, led by Jason Ashworth, takes care of certification of new products (aircraft engines and propellers) and has design change oversight (mods and STCs). Surveillance of Part 146 Aircraft Design Organisations, and Part 148 Aircraft Manufacturing Organisations is also part of the team's brief.

In addition to aircraft registration, the Registration and Airworthiness team, led by David Gill, issues Airworthiness Directives and Certificates of Airworthiness.

Peter Sutherland, the Technical Programme Manager, is also part of the Airworthiness Unit. He manages any new and challenging projects to help ensure the harmonisation of policy and procedures across the organisation.

So, if you want to submit a simple form or application that relates to engineering, email it to **airworthiness@caa.govt.nz.**

For an engineering *query*, email **info@caa.govt.nz** and it will be directed to the relevant person.

For aircraft registration forms and basic registration queries, email **aircraftregistrar@caa.govt.nz.**

For contact information see, www.caa.govt.nz > Public Info > About Us > CAA Structure > Air Transport and Airworthiness. ■

NOTAMs – At Your Nearest App Store

Created by Airways, the IFIS Mobile app offers more convenient access to NOTAMs and weather information for users doing a preflight. It's an extension of the Internet Flight Information (IFIS) Service web site.

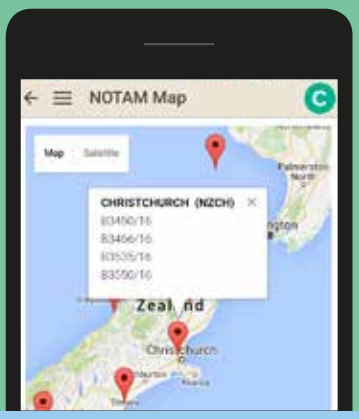
The app provides pilots and RPAS (drones) operators with a graphic depiction of NOTAMs throughout New Zealand.

It also provides weather information, narrowed down to specific briefing areas; it filters information by aerodrome; and automatically sends you NOTAM updates if you use its 'watch' facility.

But remember, the official source for pre-flight information – including NOTAMS – is www.ifis.airways.co.nz.

Weather information is also provided free to New Zealand pilots at metflight.metra.co.nz.

Another source of information about NOTAMs is your instructor at the time of your biennial flight review. See "BFR – Not a Test, but an Opportunity" on page 22. ■



Some RPL Holders **Due Refunds**

The CAA has recently reconsidered its view that the New Zealand Recreational Pilot Licence, and the ICAO-recognised licences – PPL, CPL, and ATPL – be treated as entirely separate types of aviation document.

As a consequence, the CAA intends to refund the fee charged for the issue of an RPL to existing holders of an Airline Transport Pilot Licence or a Commercial Pilot Licence.

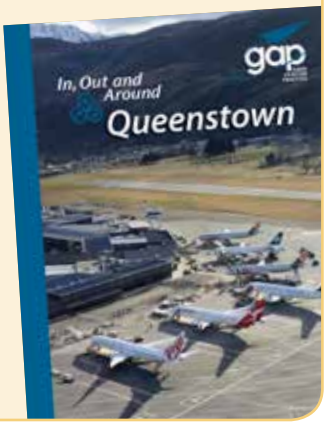
Under Rule *61.41 Use of lower pilot licence or rating*, a pilot holding an ATPL or CPL can exercise the privileges of a lesser licence, as long as they also hold a current medical certificate for that lesser licence, and meet the other currency requirements.

In accordance with that rule therefore, anyone the CAA has identified as being incorrectly charged for their Recreational Pilot Licence is to be refunded.

The CAA has already been in contact with the pilots it believes should be refunded the fee charged. If you believe you are also due a refund, but have not been contacted, please email: licensing@caa.govt.nz. ■

Revised Queenstown GAP Booklet

Too many pilots venture into mountainous areas without preparing themselves properly. Before flying into Queenstown – one of New Zealand's more demanding destinations – check the revised Queenstown GAP booklet which will give you some tips for pre-flight planning.



The booklet has been updated to reflect the latest airspace changes, and provides information on helicopter arrival and departure procedures.

Email: info@caa.govt.nz for your free copy.

Release to Service Poster

What do you need to do to make sure your machine is good to go?

This modernised poster provides a quick checklist for engineers, setting out clearly the things you need to do before certification.

It also includes references to the relevant Civil Aviation Rules.

Make sure your aircraft ticks all the boxes!

Email: info@caa.govt.nz for a free copy.

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 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.

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

Applying to the CAA for an aviation event under Part 91 does not include applying for 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
2 Aug 2017	9 Aug 2017	12 Oct 2017
30 Aug 2017	6 Sep 2017	9 Nov 2017
27 Sep 2017	4 Oct 2017	7 Dec 2017

See **www.caa.govt.nz/aip** to view the AIP cut-off dates for 2017.

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

John Keyzer
(Maintenance, North Island)
Mobile: +64 27 213 0507
Email: John.Keyzer@caa.govt.nz

Carlton Campbell
(South Island)
Mobile: +64 27 242 9673
Email: Carlton.Campbell@caa.govt.nz

Steve Backhurst
(Maintenance, South Island)
Mobile: +64 27 285 2022
Email: 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
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-JBC Pacific Aerospace 750XL	
Date and Time:	30-May-2016 at 15:15
Location:	Nicks Head Station
POB:	1
Damage:	Substantial
Nature of Flight:	Agricultural
Pilot Licence:	Commercial Pilot Licence (Aeroplane)
Age:	26 yrs
Flying Hours (Total):	3928
Flying Hours (on Type):	3428
Last 90 Days:	300

During the takeoff roll, the pilot noticed the airspeed was below that nominated at the decision point, and he started to open the hopper doors to the sow position. He then initiated a jettison at the rotate point when he realised the aircraft wasn't otherwise going to become airborne.

The aircraft travelled past the rotate point and the left wheel dragged though some soft ground that had recently been turned over, slowing the aircraft further. It clipped a fence 145 m from the end of the airstrip in a left wing low attitude.

The aircraft was controllable and so the pilot elected to return and land on the airstrip.

The pilot cannot remember clearing his hopper at the end of the sowing run, or checking his hopper was clear before accepting the next load. The hopper camera was serviceable. The sowing runs had become varied in length due to shutting-off for bush areas. As a result, product was left over at the end of some runs, and this in turn could have led to an overload situation.

CAA Occurrence Ref 16/3505

ZK-MAA Air Tractor AT-502B	
Date and Time:	21-Sep-2016 at 09:00
Location:	Oruanui
POB:	1
Damage:	Minor
Nature of Flight:	Agricultural
Pilot Licence:	Commercial Pilot Licence (Aeroplane)
Age:	35 yrs
Flying Hours (Total):	9000
Flying Hours (on Type):	4500
Last 90 Days:	199

The pilot was using an airstrip on a farm that had been converted from a forestry block. The strip had been levelled, but there were still some native bush roots in the soil.

On takeoff, the pilot struck a root that caused damage to the brake joint, resulting in a loss of hydraulic fluid. A crosswind required the pilot to apply opposing brake to keep directional control. When the aircraft started to yaw, the pilot applied opposing brake and realised that he had no brake available. While the pilot was trying to correct the yaw he did not notice the decreased airspeed.

The pilot managed to jettison most of the load before going off the end of the strip, bouncing in a rough paddock, and bending the main landing gear and the tail wheel. After getting airborne, and confirmation that the aircraft in fact still had landing gear, the pilot opted to land at Taupo.

Following the accident, an inspection of the airstrip found approximately 15 pieces of wood. To prevent a similar occurrence, a mandatory pilot inspection of the airstrip before every job has been reinstated.

CAA Occurrence Ref 16/5196

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

Diamond DA20-C1	
Filler Neck Tube	
ATA Chapter:	2800

After practising a forced landing, while beginning a go-around at full power, the student noticed a strong smell of fuel in the cabin. The student felt nauseous and slightly light headed. They closed the partially open cabin heat, and opened both side window vents to introduce fresh air. A decision was made to return to base immediately. After landing, the student was feeling better, but as a precautionary measure did not fly again for two days.

Investigation found that the cause of the strong smell of fuel in the cabin was that the filler neck vent tube had become detached. In the DA-20-C1, it is positioned behind the pilot. The filler neck vent tube was re-secured and the issue has been resolved.

CAA Occurrence Ref 16/5522

Hughes 369D	
Rollover Valve	
Part Manufacturer:	Rollover Valve
Part Number:	369H8108-505
ATA Chapter:	2820
TTIS Hours:	12899

While conducting agricultural spraying operations, the helicopter had a loss of engine power during cruise. The pilot identified the decreasing rotor RPM, and executed an autorotation to a paddock short of the loading area.

The engineering investigation found that the fuel vent line emergency shutoff valve or 'rollover valve' (part number 369H8108-505) failed in the closed position, and the fuel bladder collapsed. The deformation of the bladder prevented the fuel quantity transmitter from moving freely, and the fuel quantity indicator displayed 150 pounds remaining at the point of fuel exhaustion. The engineer replaced the fuel vent line shutoff valve and calibrated the fuel quantity transmitter.

MD Helicopters issued a service bulletin that addressed fuel vent line emergency shutoff valve failures due to possible degradation over time (Service Information Notices HN-234.1, DN-181.1, EN 73.1 and FN-60.1). The inspection and rework of the fuel vent system was last completed in accordance with Airworthiness Directive DCA/HU369/61 in October 2011. The total time accumulated on the aircraft was 1607.9 hours. The company plans to install an additional fuel flow indicator to increase fuel monitoring accuracy and provide a redundant system for fuel quantity monitoring.

CAA Occurrence Ref 16/5839

Robinson R44 II	
Manual release cable	
Part Manufacturer:	On Board systems
Part Number:	268-014-01

While conducting aerial fertiliser application, the first load of the day inadvertently released from the cargo hook during takeoff. The release occurred at approximately 50 feet above ground level.

The engineering investigation identified that there was a 1/8 inch pre-load on the manual release lever during operation, and the cable did not move freely. There was noticeable resistance when operating the manual release from the cockpit, and the cable rotated as it was actuated.

The cable was routed adjacent to a pneumatic fitting on the bottom of the fuselage that supplied compressed air to an aerial application system. During operation of the compressor, the heat emitted from the fitting melted the protective coating on the mechanical release cable. Some of the melted coating penetrated the outer cable housing and cooled, creating a threaded sleeve around the inner cable.

The manual release cable was replaced and a heat shield was installed to protect the cable.

CAA Occurrence Ref 16/6597

Eurocopter AS 350 B2	
Manual Release Cable	
Part Manufacturer:	Breeze Eastern
ATA Chapter:	2550

Shortly after takeoff, an AS350 helicopter experienced an uncommanded hook release during a sling load operation. On inspection it was found that the manual release cable thimble was fouling on the housing of the hook, causing the hook not to close completely. The hook and cable were replaced.

On Board Systems released service bulletin 159-039-00, advising that the barrel-shaped inner cable termination can potentially bind on the manual release cover and prevent the cargo hook from completely re-latching, resulting in an inadvertent load release.

CAA Occurrence Ref 17/281

Eurocopter AS 350 BA	
Oil feed Line	
Part Model:	AS350BA
Part Manufacturer:	Airbus
Part Number:	704A34-412-015
ATA Chapter	6230
TTIS Hours:	369.5

During removal of the lubrication hose (P/N 704A34-412-015) for maintenance, the engineer identified the presence of a 'rusty' substance that appeared to partially block the end of the hose.

Upon further inspection, the hose was found to be fully obstructed by the substance, and the upper union of the hose was absent of oil. The hose was returned to the manufacturer for analysis, and the upper tapered roller bearing was inspected and found to be serviceable. The obstructed hose had been installed for 369.5 aircraft hours.

Airbus Helicopters analysed the hose and released Emergency Alert Service Bulletin (EASB) 62.00.39 MAIN ROTOR - Rotor mast - Check of the rotor mast oil pipe (2017/05/19 Rev 1). The EASB dictates mandatory compliance for checking of pipe P/N 704A34-412-015. The EASB is available through Airbus Helicopters T.I.P.I. service at https://www.airbushelicopters.com/techpub. EASB documents pertaining to this mandatory check have been published for the EC 130, AS 355, and AS 350.

CAA Occurrence Ref 17/384

Guimbal Cabri G2	
Carburettor	
Part Manufacturer:	Avstar
Part Number:	AV10-6110
ATA Chapter	7320
TTIS Hours:	953.7

The pilot reported experiencing an engine 'miss' associated with a brief right yaw while lowering the collective.

On investigation, the maintenance provider suspected the problem may be due to the carburettor fitted to the aircraft.

The maintenance provider replaced the carburettor with an alternate P/N carburettor in accordance with the Lycoming Service Instruction No. 1523C, dated 15 November 2013 which rectified the problem.

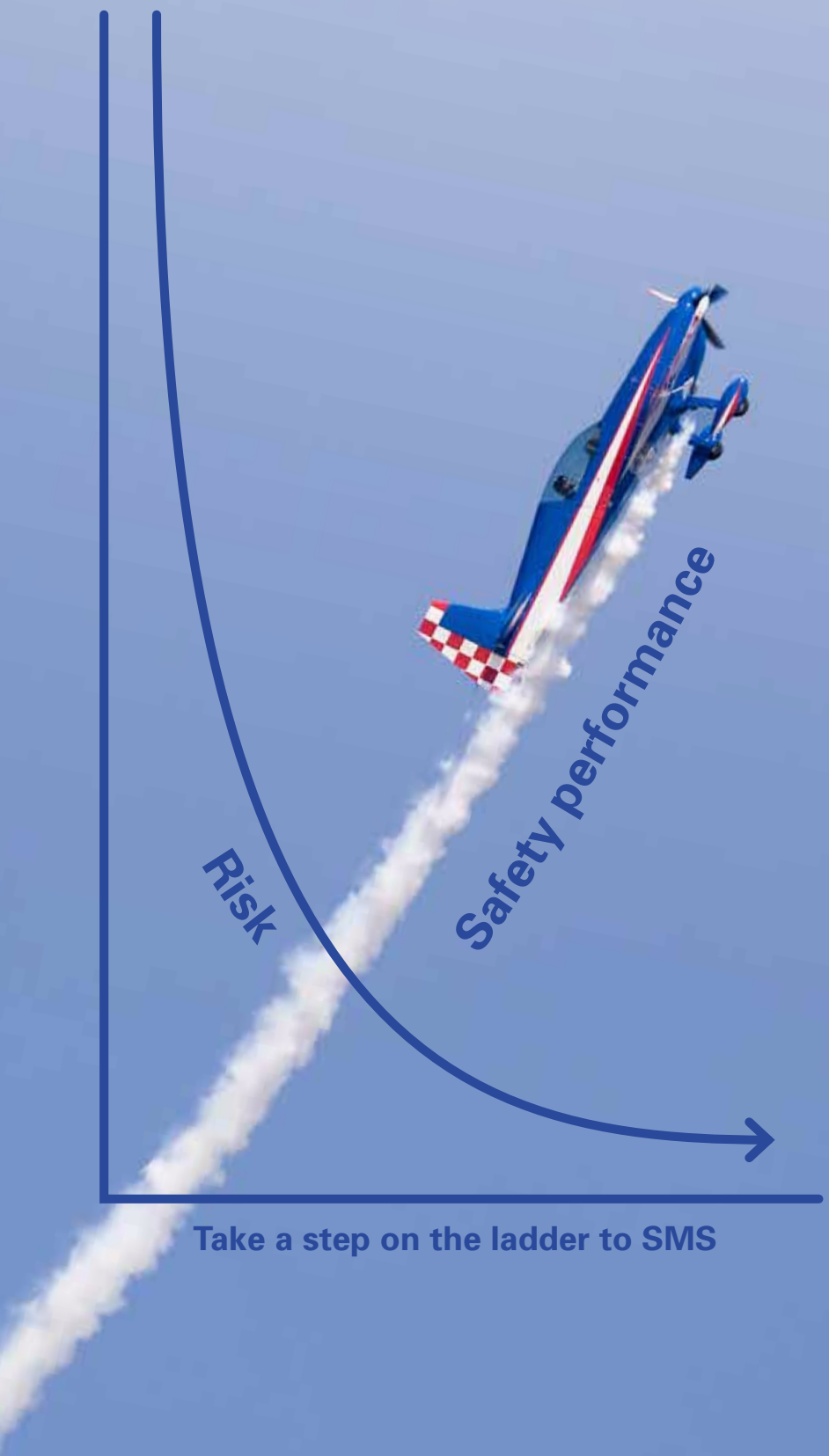
CAA Occurrence Ref 16/5033

Aviation Safety Officer Course

Dunedin

21 to 22 September 2017

Scenic Hotel Southern Cross
118 High Street, Dunedin



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 Officer.

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

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

Lunches are provided (but you will have to arrange and pay for your own accommodation, transport, and other meals).