Pointing to safer aviation

Autumn 2019

vector

HAZARD
RISK AND SMS

Loose objects

Extra eyes

Horror in a Hirtenberg

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

// LOOSE OBJECTS

// EXTRA EYES

// HORROR IN A HIRTENBERG

Cover: See the article on page 12. Photo courtesy of Amalgamated Helicopters NZ.

Back cover: Dangerous Goods poster. To order, email info@caa.govt.nz

In this issue...

// HAZARD, RISK, AND SMS

vector

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**

Published quarterly at the beginning of each season

Manager Communications and Safety Promotion Mike Richards

Team Leader Safety Promotion Kelly Gage

Editor Peter Singleton

The *Vector* team Joe Lees, Pen Mackay, Brendan McKeown, Bridget Tunnicliffe

Design Gusto

PUBLICATION CONTENT Unless expressly stated as CAA policy, the views expressed in *Vector* do not necessarily reflect the policy of the Civil Aviation Authority. Articles are intended to stimulate discussion, and nothing in *Vector* is to be taken as overriding any New Zealand civil aviation legislation, or any statements issued by the Director of Civil Aviation, or the Civil Aviation Authority of New Zealand.

Reader comments and contributions are welcome and may be published, but the Editor reserves the right to edit or abridge them, and not to publish those that are judged not to contribute constructively towards safer aviation. Reader contributions and correspondence regarding the content of *Vector* should be addressed to: *Vector* Editor, PO Box 3555, Wellington 6140, or email: **info@caa.govt.nz**.

FREE DISTRIBUTION *Vector* is distributed to all New Zealand flight crew, air traffic controllers, aircraft maintenance engineers, aircraft owners, most organisations holding an aviation document, and others interested in promoting safer aviation. For flight crew and air traffic controllers, an aviation medical certificate must be held, and a New Zealand address given, to receive *Vector*.

Holders of pilot or parachutist certificates issued by Part 149 certificated organisations can also apply to receive a free *Vector*.

Vector also appears on the CAA's website – subscribe to our email notification service to receive an email when it is published, **www.caa.govt.nz/subscribe**.

CHANGE OF ADDRESS Readers receiving *Vector* free of charge should notify info@caa.govt.nz of any change of address, quoting your CAA Client Number. Paying subscribers should notify Vertia.

PAID SUBSCRIPTIONS *Vector* is available on subscription only from Vertia, www.vertia.co.nz, email: info@vertia.co.nz, or freephone 0800 GET RULES (0800 438 785).

New Zealand Government

ISSN 1173-9614

From the Director

Welcome to the Autumn issue of *Vector*, happy New Year and I hope 2019 is a satisfying and successful year for you.

At this time of year, commercial and recreational aviation activity is at its peak. Recreational flyers in particular are making the most of the clear blue skies and long hours of daylight. No matter how experienced you are, I urge you to fly safely this summer and never lose sight of good airmanship. Remember, check and then check again.

Do plan your flight to the last detail, check NOTAMs for your route, your landing spots and possible alternates. Check the airport/facility directory for any special instructions or advisories. Will the fuel pump at your destination be open?

Do use checklists from preflight to touchdown – no matter how well you think you know your aircraft, make sure you do everything by the book, every time.

Do give your passengers a thorough safety briefing – they are your most precious cargo. Every time you fly with passengers, even if they've flown with you before, ensure they know how to operate the seat belts, harnesses, door and window latches. Go over an evacuation plan in a way that doesn't scare them but gives them vital instructions just in case.

Do speak clearly and plainly on the radio – remember the four Cs – make your calls clear, concise, consistent, and correct. Always think about what you're going to say and use the correct phraseology.

Don't bust controlled airspace – plan your entry into controlled airspace well in advance and make sure you have contingency plans if you are unable to enter when you expect to.

Happy and safe flying.

Graeme Harris

CAA WEBSITE SURVEY

Thank you to everyone who took part in the survey about our website. We'll be using your feedback to make our new website even better.

For a summary of results, visit: www.caa.govt.nz/websurvey

FOLLOW US ON FACEBOOK

CAA is now on Facebook!

Follow us to stay up-to-date with CAA news, safety messages, events, upcoming courses, and featured *Vector* articles. We'll be building our content so you can expect to see more frequent updates over the coming months.

Search 'Civil Aviation Authority NZ' on Facebook to find our page, and follow along!

VECTOR IS ONLINE

Vector magazine is online in PDF form that can easily be viewed on all devices. Visit:

caa.govt.nz/vector

You can also subscribe to receive an email when *Vector* is added to the CAA website:

caa.govt.nz/subscribe

This article is reproduced from the July/August 2009 *Vector*.

LOOSE OBJECTS

Unsecured items in and around helicopters can be a deadly and significant safety hazard.

One operator remembers the day a $10 tarpaulin was picked up by the downwash of a Hughes 369 and hurled through the main rotor disc – causing over $350,000 worth of damage. The transmission, rotor head, drive shaft, engine, blade, and other components all needed overhauling or replacing. Additional to this were the significant insurance costs – not just the excess but the future premium increases, and the loss of revenue while the helicopter was on the ground.

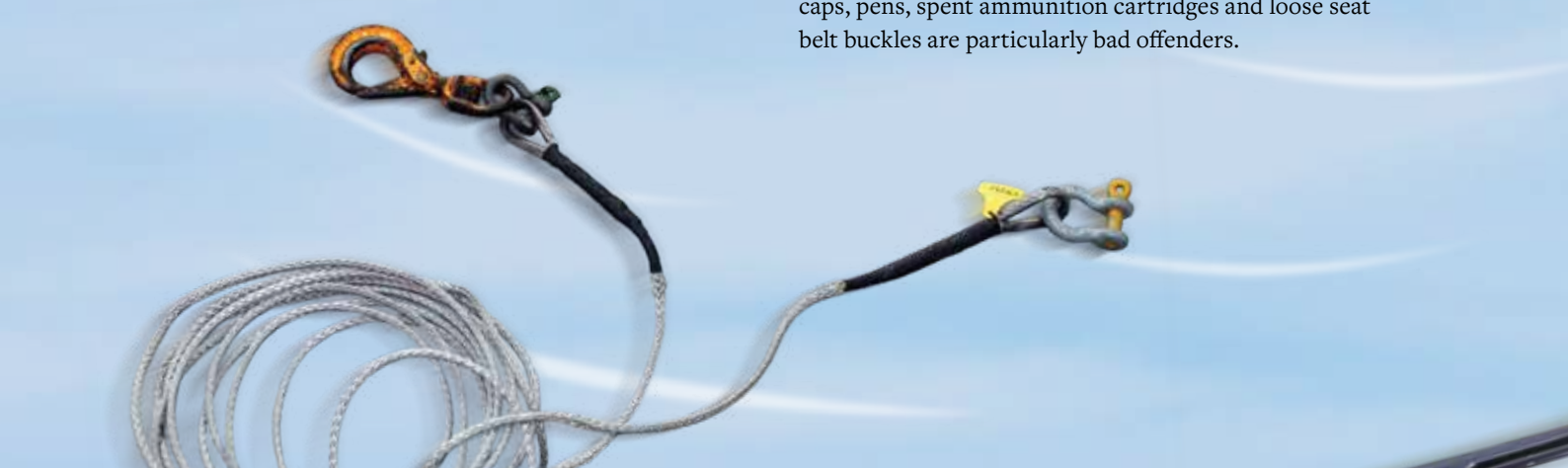
Inside

A more recent incident has highlighted the need to secure items inside the helicopter properly. A box sitting on the front seat of an R22, secured only with the inertial reel harness, slipped sideways off the seat and jammed the cyclic, giving the pilot a nasty surprise, and causing a loss of control on landing.

Frank Robinson (founder of the Robinson Helicopter Company) tells the story of a friend who put a tree stump on the seat of an R22 and secured it with the inertial reel harness. The stump fell forward, jamming the cyclic forward. The pilot could not get it back on to the seat and crashed through the roof of a shop – tragically killing himself but fortunately nobody else.

Many a situation has occurred where an unsecured item has worked its way out of an open door. Far too often, the item passes through the tail rotor on its way to being lost.

Keeping a cabin tidy is just as important. Anything that can work its way into an open crevice probably will. Rob Mills, Flight Operations Inspector Rotary Wing recalls, “I once had to ditch a Jet Ranger, and when it came to exiting the helicopter, the stuff that had been lying around the cabin – like spare headsets, maps, and tie-downs – was caught up around my feet. It made me think quite carefully about cabin tidiness.” Camera lens caps, pens, spent ammunition cartridges and loose seat belt buckles are particularly bad offenders.



Outside

Making sure loose items in landing areas are secured is equally important. Even objects that seem weighty, like helicopter doors, can be sucked up through the rotor blades. Even something that seems innocuous, like a plastic bag, can cause significant vibration and damage to the blades.

Briefings

There is something about the noise, the smell, and the 'invisible' rotor disc that disconnects a person's brain when they are around helicopters.

A thorough briefing for everybody in and around a helicopter is essential, even if they think they know what they are doing – it's often the experienced person who tends to do the most dangerous things.

In your briefing, cover all the things you want them to do, all the things you don't want them to do, and then watch them like a hawk – always expecting the worst. And tell them to resist the urge to put their heads down and run, like they've seen in the movies! They must see where they are going at all times.

The CAA has a number of resources available to help with your briefing. There are two *Safety around Helicopters* posters, one works particularly well with non-English speakers, and the *Safety around Helicopters* DVD.

For a copy of the posters, or to borrow a copy of the DVD from the CAA library, email us at info@caa.govt.nz. You can also buy a copy of the DVD – details are on the CAA website, www.caa.govt.nz.

EXTRA EYES

////

A couple of occurrences last year serve as a good reminder of the importance ground handlers play in aviation safety.

"It was just a normal turnaround at Dunedin, and I remember the dispatcher actually saw me doing the (aircraft) walkaround," recalls Ian Munro, an airline training manager at Air New Zealand.

He's talking about a typical day in August last year, when a Mount Cook Airline flight was getting ready for departure from Dunedin. Ian considers his walkarounds very thorough.

But something didn't look quite right to ground dispatcher Noorua Metua that day. When the flight crew were on the flight deck preparing for departure, she advised Ian over the intercom that she thought the nose gear doors looked different to how they did on other aircraft.

"So the first officer hopped out and he said, 'yes it does look slightly different' so we got the engineer across and he had a look and measured all the tolerances," says Ian.

It turned out one of the nose doors was slightly lower than the other but it was still within tolerances. So in the end there was no issue, and the flight departed as normal.

"But I just thought it was fantastic the ground dispatcher actually had the gumption to raise it – even knowing that I had done a visual inspection myself, and she had seen me doing that – I thought it was really great," says Ian.

Noorua Metua, who has been in the job since November 2017, is methodical about what she does.

"I did my walkaround and I just noticed they [the nose gear doors] looked a bit odd because one looked lower than it should be."

Noorua says she has a mental checklist she goes through.

"We get told what to look out for and what's not right."

Was she shy about speaking up?

"Not really, because even if it's something little, I prefer to ask. It doesn't worry me if it means nothing, even though I'm shy. It's for my peace of mind and for the passengers and the pilot and the plane and everyone here. It doesn't worry me if it's nothing, I would rather be safe."

Noorua's brother, Rorua Metua, happens to be the ramp manager at Mount Cook in Dunedin.

"Our ground handling staff are well-trained. They go through a standard operating procedure, a proper 'this is how you check the plane, this is how you work around the plane' so there are specific steps. It's a mental checklist because there are so many different things to look out for," says Rorua.

// It's for my peace of mind and for the passengers and the pilot and the plane and everyone here. It doesn't worry me if it's nothing, I would rather be safe. //

"You're looking for those indicators to make sure the plane is okay, and if something is unusual then you speak up about it and say 'can you guys have a look at this?'

"It's really pleasing when the person involved, even though they might be quite shy like Noorua, with the training she got, she spoke up."

It's okay to question

Ian Munro says ground handlers are very diligent, observant people who play an important role in safety.

"You can appreciate that, while safety is always paramount, turnarounds are a hive of activity with a lot happening. But Noorua was still doing the right thing, looking around."

The thing that really impressed him was Noorua's ability to question.

Ian says she did exactly what they expect ground handlers to do.

"It can probably be a little bit daunting actually, seeing the captain kneel down and do a visual inspection and then, you know, it could be seen as a challenge to what the captain has viewed as acceptable. But it wasn't – she's backed it up and questioned things, I thought that was great." »

A must-have

In May last year, a ground handler in Wellington noticed something unusual on an Air Nelson-operated aircraft after pushback.

He reported a pin in the nosewheel assembly was sticking out about 50 mm.

Engineering was phoned and after some discussion it was decided to return to the gate and shut down.

> // Every single skill our staff in the ground handler team complete is revalidated inside a three year period. //

On inspection, an engineer found the nosewheel lower castor cover hinge was broken. A defect log was raised and all passengers were transferred to another aircraft. The first officer reported he did not notice the pin sticking out as the push back tug was connected to the nose wheel.

Chris Ancell is the training consultant in Wellington with the School of Ground Operations for Air New Zealand.

He remembers the incident and says ground handlers provide a vital role.

"They are an extra set of eyes for the flight crews and the engineers. The engineers can't meet every single aircraft so having ground handling teams fills a gap I guess. It's not a nice to have, it's a must have, because if we're not helping perform that role then things could slip through the cracks."

He says training is an ongoing thing with regular refreshers.

"Every single skill our staff in the ground handler team complete is revalidated inside a three-year period."

As a trainer, Chris says he can't emphasis enough the importance of speaking up.

"Absolutely – safety first. Better to check it and it be nothing, rather than not check it and it be something."

Photo courtesy of Mark Doherty.

// Noorua Metua spoke up when she spotted a difference in the nose gear doors.

INVESTIGATING ACCIDENT THEMES

An innovative tool is helping CAA's safety investigators tackle complex issues using a system approach.

Normally, CAA's safety investigators investigate specific events or occurrences, such as accidents, incidents, and defects, but they're also working proactively to solve wider system issues.

Most problems and possibilities for safety improvement belong to the system, rather than to isolated individuals, events, or outcomes. In a system, everything is connected to something: nothing is completely independent. People interact with each other, with types of equipment, with information, and with procedures.

This is where Themes and Systems Safety Investigation (TSSI) comes in. It takes a system-wide view to solve possible safety risks across the aviation system to prevent incidents.

There are two components:

- Theme investigations identify patterns or similarities in the precursors, or factors, observed in occurrences or safety data.
- System investigations examine the socio-technical systems in operation (interaction between people and technology) to determine the factors creating the problem.

When leading a TSSI, CAA's safety investigators will engage closely with experts and interested parties from across industry and within CAA to understand how the system is operating.

The purpose of the TSSI is to:

- precisely define what the problem is and why it exists
- facilitate systems thinking
- provide the right information to the right people
- enable them to do the right things to solve the issue.

The value of identifying precursors

The traditional role of safety investigation has been to analyse accidents and serious incidents to determine the causal factors, and prevent reoccurrence. It's still important to do this, and in an incident you will still be required to complete a report.

This is a reactive approach however. It doesn't always take into account relatively minor events that may not have had an obvious effect on that particular outcome. In a TSSI, we want to understand the full picture of the situation at the time of the event. It's also essential to consider and include any precursors in the report.

Having an awareness and understanding of the precursors means we can define and implement strategies to address the risk factors, limiting serious outcomes, and improve the safety of the aviation system.

Changes to the CA005

The way in which safety investigations are reported to the CAA (currently using the CA005 form) is being reviewed.

The proposed changes will help you, as the reporter and initial investigator, to provide our safety investigators and analysts with as much information as possible about the contributing factors and precursors.

More information

To read more about TSSI, visit www.caa.govt.nz/accidents-and-incidents.

To report occurrences online, visit www.caa.govt.nz/report.

GO BACK THREE STEPS

Some suggestions on how to deal with interruption.

In today's era of electronic communication, our daily work routine is peppered with interruptions.

Distraction has always been one of the 'Dirty Dozen' most common conditions contributing to accidents or incidents. What's different in today's world of mobile phones and instant messaging, is that distraction is so pervasive.

Closely related to distraction is interruption. While distraction is usually something unplanned, like a loud noise, interruption is intentional.

The book *Your Brain at Work* says an American study found that, on average, a typical worker is interrupted by an outside source every 11 minutes.

The study also found that workers 'self-interrupt' – checking emails for instance – and that brought the time between interruptions down to about three minutes.

If the interruption is off-task, the research indicated it can take, on average, 23 minutes to refocus.

Avcraft Engineering in Feilding is very aware of the potentially catastrophic impact of someone being interrupted mid-task.

During monthly training sessions, details of any relevant maintenance-related incidents or accidents from overseas are studied by all 12 engineers, and discussion encouraged on ways the company can avoid a similar occurrence.

Engineering Manager Mat Bailey says the occurrences they examine are often due to an engineer being interrupted at some point; then missing a step or not finishing a task.

"So we have procedures where, if an engineer does have to pause a task, they always record where they got to. When using an inspection checklist, marking off and initialling each step as it's completed ensures continuity. That's really important, particularly with something like a service bulletin that might have 100 or more steps to work through. A supervisor will always oversee the whole job and monitor each step as complete. So if there is an interruption, everyone knows at what point the job is at.

"Sometimes we may go forward a few steps because that makes the job flow better, but proper use of a checklist means we can easily know what still needs to be done."

A SKYbrary article from the Flight Safety Foundation maintains that a task being interrupted because of a distraction is the number one cause of forgetting things.

Also, "humans tend to think ahead", SKYbrary says. "Thus, when returning to a task following a distraction, we have a tendency to think we are *further ahead than we actually are*." (*Vector* emphasis)

While that's an everyday annoyance, in safety-critical activities like piloting or aircraft engineering, it can also lead to disaster.

Flight crews not completing a checklist has been found to be at least partially responsible for many deadly aviation accidents.

In many cases, follow-up studies have indicated interruptions contributed to those failures to finish a checklist.

In 1987–88, the National Transportation Safety Board (NTSB) investigated the crash of a Northwest Airlines McDonnell Douglas DC-9-82 shortly after take-off from a Detroit airport.

The NTSB found that constant interruptions – and a change in runway assignment during preparation for take-off – ultimately led to the crash. It found the crew failed to recognise the flaps had not been set to take-off position, and didn't complete the checklist alerting them to the flap position.

Tragically, the warning circuit alerting them to the flap problem also failed. All but one of the 155 people on board died.[1]

Only 12 months later, an almost identical accident occurred when the crew of a Boeing 727 crashed due to an interrupted checklist process.

1 NTSB/AAR-88/05

// Electronic devices can be a valuable aid in tracking maintenance and for referring to manuals – but are email alerts turned off to prevent distraction?

Some ideas

It's obviously best to finish a task before responding to an interruption. If that's not possible, clearly mark the project to remind you where to take it up again.

Or go back at least three steps on your checklist, so the work can be retraced. If necessary, have someone else double-check the work using their checklist.

It should also be part of any company's safety management system to establish procedures minimising interruption of workers carrying out safety-critical tasks – for instance banning cellphones in the hangar.

The company might also designate 'discussion times' – workers being left alone otherwise. Jason Womack, a productivity and performance specialist, recommends workers write down thoughts or questions and schedule a couple of times a day with a co-worker to discuss them.

Avcraft Engineering incorporate all these things to reduce the risk posed by interruptions.

But Mat Bailey says ensuring safety around interruption is not a matter of just having senior engineers constantly supervising the others to make sure they comply with workplace practice.

"We cannot be hovering over the engineers all the time. They have to believe, themselves, in those principles and embed them into their work practices.

"Ours is a culture of minimal interruptions, and we are all mindful of the implications of interrupting somebody during a task.

"Visits to the hangar floor by the public are also limited, partially because of their potential to interrupt engineers during safety-critical tasks.

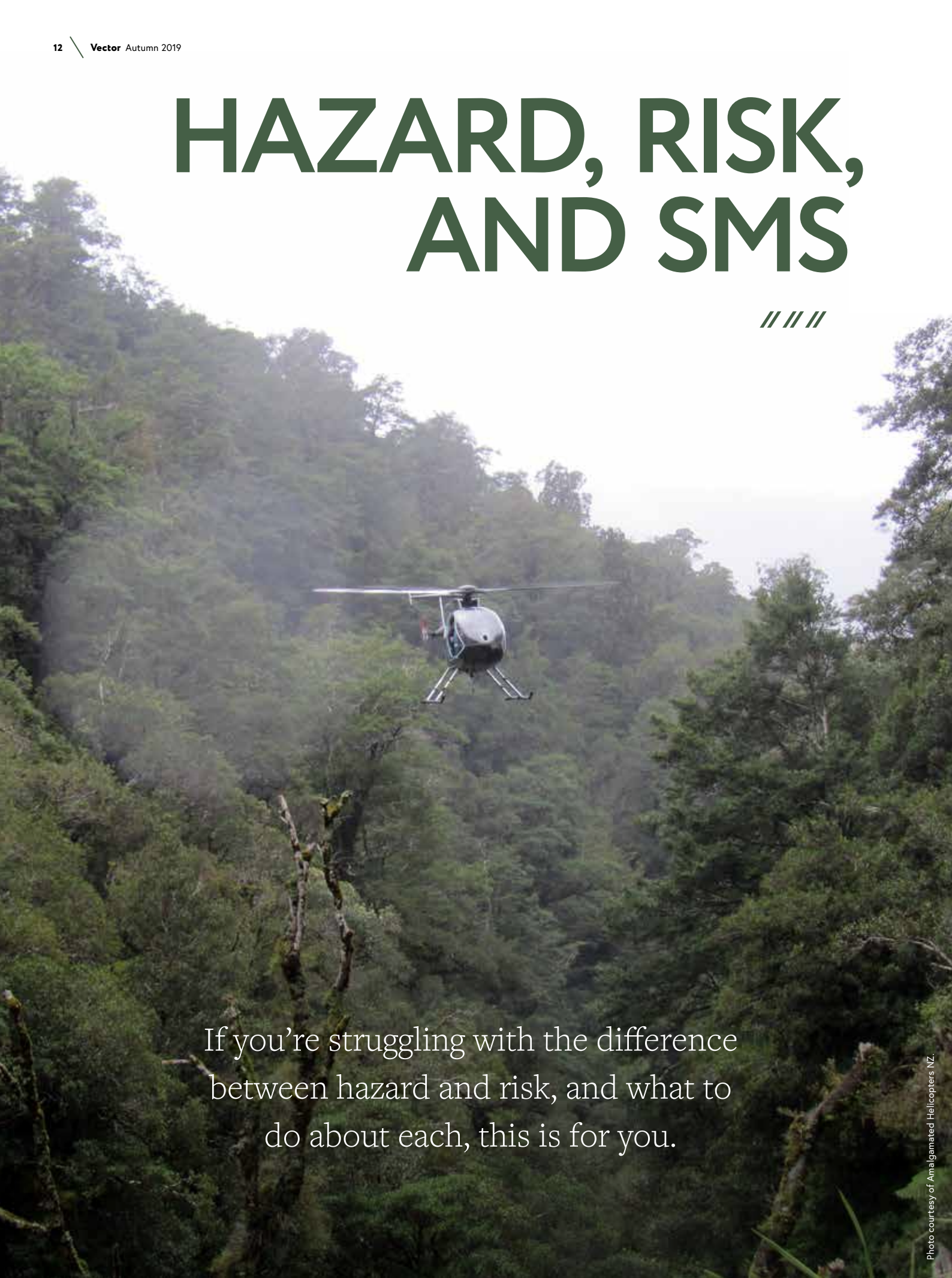
"So if someone really has to talk to a second person, they will approach them with, 'do you have time to talk about this now?' We expect the second engineer to assess, themselves, whether they are in a critical stage of their job and cannot talk right at that time, or whether they can respond straight away and then easily and safely pick up the task after."

There's a final benefit to keeping interruptions to a minimum. In 2005, Basex Technology found that interruptions and the resulting loss of productivity was costing United States businesses $US588 billion a year.

The economic benefit of allowing workers to focus on their job isn't lost on Avcraft Engineering.

"Minimal interruption means our work is much more efficient, and that translates into economic efficiency," says Mat.

HAZARD, RISK, AND SMS



If you're struggling with the difference between hazard and risk, and what to do about each, this is for you.

Photo courtesy of Amalgamated Helicopters NZ.

A 'hazard' is anything with the potential to cause harm. The 'risk' associated with that hazard is assessed by looking at the probability of that harm happening, together with the severity of the consequences if it did happen.

Think of an uncapped bottle of bleach left out on the kitchen bench during the school holidays. It's an obvious hazard, and the probability of it causing harm is high because it's opened and within reach of small hands. The consequences are also severe – eyes being splashed with it, for instance, should the worst occur. So it is high-risk.

But if that same bottle of bleach is now firmly capped, on a high shelf, and in a locked cupboard, the risk is much lowered because – while the consequences of a child getting hold of it are still very undesirable – the probability of them doing so are almost nil.

The placing of the bleach high in a locked cupboard is the 'control', reducing the risk to as low as reasonably practicable.

And that, in a nutshell, is a risk management process – one of the fundamentals of a safety management system (SMS).

Let's look at an aviation example. A maintenance engineer using an adjustable spanner may be a hazard. The risk of them doing that will be a combination of how probable it is, and its consequences for the airworthiness of the aircraft they're maintaining.

In a workshop lacking robust tool control, or appropriate tooling, the probability might be quite high.

But the following are all controls against the worst happening, aiming to lower the risk to as low as reasonably practicable:

- robust maintenance procedures, including strict tool control
- a positive safety culture throughout the organisation
- properly trained engineers who understand the significance of using appropriate tools
  - who are supervised, and
  - whose work is checked off by a superior.

First, the hazard

It all starts with identifying the hazard. CAA safety management systems specialist Trevor Jellie offers the following advice to operators struggling with that first step.

"Hazards will be identified from 'walkaround' hazard surveys, occurrence reporting, internal audits, safety investigations, change management, and management reviews.

"One of the most valuable sources of information is frontline staff who're actually 'doing the job'. For instance, the flight followers who identified weak points in a company's emergency response plan. And the ground crewman who identified on-site hazards with farmers before a spray job."

Trevor says experience has shown a staff get-together to brainstorm ideas is most effective if it's not attached to any other activity, like the monthly staff meeting where other agenda items are up for consideration. "In other words have a staff meeting *dedicated* to hazard brainstorming."

Too small a group of people identifying the hazards in an organisation can lead to a narrow focus on one area. For instance, those of the 'slips, bumps, and falls' worksite variety. Trevor advocates for as wide an approach as possible.

The benefit of casting a broad net for information is illustrated by a story from Brian Dravitzki, Senior Base Engineer of Helicopters (NZ), in New Plymouth.

"An offshore operator had an inflight event where a shop rag was left accidentally in a tail rotor drive train area during maintenance and the rag became entangled with the driveshaft causing considerable damage to the driveshaft and tail boom wiring.

"The heightened awareness and the possibility of that happening to us meant rags quickly became an identified hazard. We assessed the risk of FOD (foreign object debris) such as these causing issues in the future and immediately came up with a process to control the use and storage of rags, the same as our tool control process."

Trevor Jellie says a well-constructed register of hazards will include those associated with each type of operational activity. In heli ops, for instance, lifting, spraying, and passenger transport.

"There are also hazards related to ground activities, such as refuelling and loading of cargo. There are organisational hazards such as potential loss of key staff, and business hazards such as loss of insurance cover." »

Trevor offers these ideas for effective hazard identification:

- Consider the complete cycle of each type of operation conducted. What hazards there could be from the beginning of the day when the pilot and aircraft are preparing to fly (pilot fatigue, improper fuelling) through all the activities of the day (poor weather decisions, time pressures) to the end of the day when pilot and helicopter are put to bed (rushed postflight check). The CAA's SMS team call this the 'day in the life' approach.
- Brainstorm the collective knowledge in the organisation for 'what has bitten us in the past?' and 'what gave us a fright?'
- Consider that what's happened to other operators 'could happen to us'.
- Break down each organisational exercise to human, human-machine interface, and procedural tasks, and look for the hazards associated with each.
- Undertake a trend analysis on what safety data has been collected. The amount of information might be small at the beginning of establishing an SMS but it could still be useful. A steady increase in occurrences will indicate, for instance, that a control is either weak or missing.

Trevor also says to successfully identify all the hazards in an organisation everyone needs to think beyond the obvious.

"Look for the more subtle dangers. For example, poor maintenance is obvious, but an overrun of a lifed component because the maintenance controller was overloaded by concurrent Part 145 commitments is not so obvious.

"Likewise, bad weather is an obvious hazard but pushing on through bad weather to get home at the end of a long, tough day indicates a hazard exists in pilot decision-making."

Recording the hazard

Trevor Jellie says recording hazards must be simple, and every member of the organisation needs to be able to do it easily.

"One of the best hazard registers I've seen is a battered, well-used tablet carted everywhere by an operations manager. It has tabs for each type of operation, the base, and all the organisational stuff."

That operations manager is Jason 'JD' Diedrichs, of Amalgamated Helicopters in Wairarapa.

"We went online to give staff easy access to hazard identification," says JD. "We started out with general hazards then got more specific according to the task. If a pilot is going to a spray job, they can click on the appropriate tab and see each hazard, its associated risk, and the controls, for that job.

"We did have a paper hazard register but it was unwieldy, and it was hard getting staff to participate. This way is much easier and the staff are more forthcoming.

"We have all this information in hard copy document form as well, so if we lose connectivity for whatever reason, we have backup."

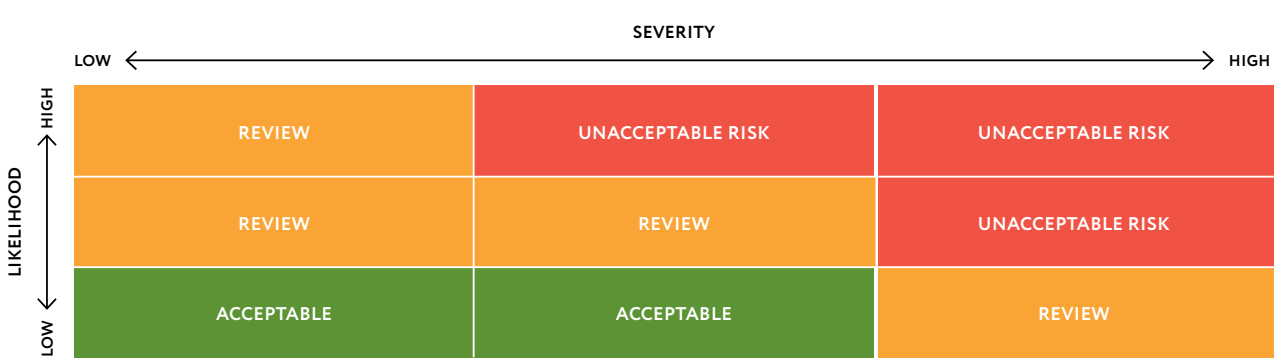
Then, the risk

Noting a hazard and its associated risk in a folder or spreadsheet somewhere does not equate to controlling the impact of that risk.

"Some organisations I've seen pile their identified hazards into a register like it's a 'bucket'," says CAA safety management system specialist Simon Carter.

"And then they rarely review the risks and stated controls. No one is monitoring properly what happens next.

"The risk associated with a hazard has to be assessed; then ranked (say, from intolerable to acceptable); controls to minimise the risk identified and put in place; and the effectiveness of those controls assessed."



// There are many ways an organisation can assess risk. Here is one: a simple risk matrix. Each organisation, however, should do what works for them.

Photo courtesy of Amalgamated Helicopters NZ.

// A controlled burn in rural Wairarapa.

JD says all his staff were involved in an initial brainstorming session to identify hazards, and they were also involved in the process of assigning risk.

"There were multiple benefits. We got some different ideas about just how much risk a hazard presented, but also, everyone was involved in improving safety.

"With some of the younger employees, they can disengage when it comes to talking about safety and SMS and hazards and risk, so the more we can involve them, make them responsible for a particular area of SMS, the more connected they'll be to what we're trying to do."

Having established the risk associated with a hazard, the next step is to nominate someone to be responsible (the 'owner' of the risk) for ensuring that controls are identified, developed, applied, and assessed. That person should not always be the safety manager.

A safety manager should make sure risk owners are managing their area of responsibility, Simon Carter believes, but the safety manager is not Ms or Mr Fixit for every risk in the organisation.

"They can't necessarily be the owner of an operational risk, or a risk in the maintenance area – both may be completely out of their area of expertise."

Once someone is identified as the owner of the risk, they need to follow through with identifying and developing controls against that risk.

"They are expected to see through the lowering of the risk to as low as reasonably practicable, but in some organisations some risk owners are not actually doing that," says Simon.

"If it's out of their area of expertise, they need to escalate it up the line to someone who can manage or reduce the risk. That needs to be done formally so it doesn't fall through the cracks."

That ties in with appropriate people being nominated as the owner of each risk in the first place.

"The person who's accountable for accepting the stated risk controls must be someone who knows something about it, and who has the appropriate authority and resources to implement controls," says Simon.

Now, the controls

The controls stated in the risk register have to be specific, robust, and their effectiveness measurable. A control against using an adjustable spanner has to be something more than 'engineer awareness'.

Simon Carter believes the most effective thing an organisation can do is to establish a formal risk and control review programme.

"A formal meeting can be set at regular intervals, or in smaller organisations it could be just a 'let's get around the table'.

"Such a review looks at each risk with a really critical eye – the less tolerable the risk, the more closely it, and the effectiveness of its controls, is looked at.

"But a low risk should be examined carefully too. You need to consider, 'is this rating still really appropriate? If not, could reality bite me?'"

ALL ABOUT IA HOLDERS

When it comes to your review of airworthiness, the IA holder plays an integral role.

Only licensed aircraft maintenance engineers (LAMEs) who hold a certificate of inspection authorisation (IA) are certified to carry out reviews of airworthiness (RA). This requires additional training, and approval by the Director. It also brings with it the significant responsibility of checking that operators are maintaining their aircraft in an airworthy condition.

The certificate also allows the holder to certify conformity of major repairs and modifications to acceptable technical data. It doesn't, however, allow the holder to approve technical data.

The RA and IA system was introduced in 1996 as part of wider changes vesting more responsibility for safety within the aviation industry.

It replaced a system requiring operators to have the CAA thoroughly check their aircraft and paperwork every four years. This survey was known as a 'C of A (certificate of airworthiness) renewal'. At that time, most aircraft had a terminating C of A, and the renewal process was expensive and unpopular with aircraft owners.

So what does the holder of an IA do?

These days the IA holder is, in effect, acting on behalf of the Director when they carry out the review of airworthiness on your aircraft.

So, when certifying reviews, the IA holder must use their own IA certificate number rather than their company authorisations.

The RA is a condition, conformity, and compliance audit. It involves a thorough check of an aircraft's maintenance history against its current maintenance programme.

Reviews must be completed every 365 days for most GA aircraft. From 30 October 2017, however, non hire or reward aircraft require a review only every 24 months. Special category aircraft also have a 730-day period.

The IA holder will check all aircraft maintenance records dating back to the previous review, as well as the aircraft's suite of maintenance log books and its flight manual.

In many circumstances, the LAME and the IA holder are the same person. But when carrying out an RA, the IA holder must take off their 'maintenance engineer' hat and put on their 'auditor' hat.

This could put the LAME/IA holder in a position of professional conflict. The maintenance provider will want to give their clients a seamless, professional, and competitive service, but this must not lead to compromise. The IA holder must put aside commercial pressures to stay onside with the operator, and report any defects found as they examine the aircraft and its documents. RA reports must be submitted to the CAA within seven days.

The RA is not the same as a 100-hour inspection. While many operators will aim to have the RA done at the same time as the aircraft's 100-hour inspection, the two are very different processes. The 100-hour inspection is a detailed, hands-on mechanical inspection whereas the RA is a check of all the relevant paperwork, and is a general condition inspection. Also, certification that the review has been completed is different to the typical 'release to service' after maintenance.

It's also important for operators to remember that responsibility for ensuring an aircraft has a current RA rests with them as the operator; not the LAME or the IA holder.

Photo: iStockphoto.com/industryview

How to become the holder of an IA

To obtain a certificate of inspection authorisation you need to successfully complete a three-day IA course and an examination on the final day of the course.

To qualify to attend the course, you need to meet the following prerequisites:

- hold a rated CAA Part 66 aircraft maintenance engineers licence (AMEL) in both aeroplane and powerplant categories, or in both rotorcraft and powerplant categories; or
- hold an equivalent CASA Part 66 AMEL registered in NZ, as per rule 66.203(1).

To have an IA issued you need to meet the experience requirements of rule 66.203(1)(ii), ie, five years.

Other requirements are detailed under rule 66.9 *Issue of licences, certificates and ratings* and include meeting fit and proper person criteria, competency in the English language, and ensuring that the issue of the certificate will not be contrary to the interests of aviation safety.

Certificates are valid for 60 months. To renew your certificate, you must attend a renewal course run by the CAA.

To maintain currency while holding the certificate, you must carry out at least four RAs a year, or four conformity inspections, (or a combination of both), or attend a renewal course.

More information

To find out more about becoming an IA holder, including information on courses (at least one initial and one renewal course is run per year), visit www.caa.govt.nz/maintenance or email licensing@caa.govt.nz.

ON WATCH FOR WILDLIFE

Wildlife refuge areas are not marked on aeronautical charts, but the chance of a bird strike around them is much heightened.

CAA helicopter flight operations inspector Richard Martin knows first-hand what can happen in a bird strike.

"While operating off a ship some years ago, I'd just lifted off the deck when a sea bird bounced off the front Perspex® screen and into the pitch change mechanism of the main rotor. Most of its feathers spread over the engine particle separator and oil cooling intake screen.

"Fortunately, the ship was still only 200 metres away so my helicopter was back on the deck pretty quickly. Unfortunately that did the bird no good whatsoever."

Richard has been investigating an aviation related concern after a member of a conservation group complained about aircraft flying over the Whangārei wildlife reserve.

Up to 90 percent of Whangārei's harbour and its coastal regions is a Department of Conservation reserve, including areas bordering Whangārei aerodrome.

But this reserve, like all the others, isn't marked on aeronautical charts. So Richard's advice is that, around coastlines, rivers, estuaries and wetlands – and particularly in summer – pilots should stay well above minimum height, and keep an eye out for winged competition.

"Maintaining a 1000 ft height plays to self-preservation because most bird strikes happen between 50 and 800 ft."

In general, turbine-engine aeroplanes are more vulnerable than piston-engine aeroplanes; firstly because of their greater speed and lower noise level ahead of their flight path. Secondly; the intake to the turbine engine faces forward, often without any filter to prevent ingress by objects like birds.

"And beyond self-preservation, an aircraft travelling over sanctuary areas well above where the birds are likely to be, is more neighbourly."

Helicopters fly in the same airspace as birds – often below 500 ft, and should face a high bird strike risk. Birds, however, seem to perceive the presence of helicopters a lot more easily than they do aeroplanes, and most of the time, move out of the helicopter's path.

There's not much to be done about the mass of any bird threatening to collide with an aircraft, but reducing cruise speed in high-risk areas will help, should the worst happen.

If you're flying near or over such an area, turn on all the aircraft lights, including landing lights and strobes, to make the aircraft is as conspicuous as possible.

It's good practice to avoid flying really close to any harbour mouth or dune bank, as they are typical breeding and roosting areas for a number of wading birds.

And for more information, email info@caa.govt.nz for a free copy of the Good Aviation Practice booklet, *Bird Hazards.*

// The Pied Stilt is common at Waituna wetlands near Invercargill aerodrome.

Photo courtesy of Raewyn Adams.

Photo courtesy of aflyinghistory.com

I learned about flying from that //

HORROR IN A HIRTENBERG

A seasoned flier looks back on a teenage flight that could have ended his life.

In 1954, I was very fortunate to be granted a Royal Air Force cadet force flying scholarship, which allowed me to get my private pilot licence at 17.

To keep in flying practice afterwards, I offered flights to anybody who would share the cost of transportation to the airport. So one Saturday morning, two of us fronted up to the Croydon Aero Club, south of London, to borrow a Tiger Moth, only to learn that we'd have to join the club and pay to fly.

I gave my companion the sad news. It was a perfect day for flying, others were preflighting Tiger Moths, Chipmunks, Miles Hawks, Percival Gulls, and a machine that I didn't recognise, which I approached curiously.

Somebody told us it was a 'Hirtenberg' – a wartime Luftwaffe light aircraft which, after Germany's surrender, went to the research body, the Royal Aircraft Establishment. The 'establishment' was set up to evaluate captured enemy aircraft and demonstrate their characteristics to RAF pilots.

It was then sold as war surplus to the local chapter of the Experimental Flying Group – about 30 private pilots, unable to afford aero club rates.

I mentioned to a member of the group that I'd just got my PPL, and could I fly the German aircraft? I was assured I'd need only a quick circuit to check me out.

He helped me into the rear cockpit and pointed out a few controls and instruments. »

"Throttle's on your left, just like a Tiger. Oh, and the airspeed indicator's in kilometres and the altimeter's in metres. But don't worry, we climb and descend at 90, and 300 metres is near enough to the circuit height of 1000 feet.

"Ignore all those German signs and funny instruments 'coz none of us know what they are either."

I looked at the bewildering array of strange dials and unintelligible notices while he chocked the wheels and positioned himself in front of the propeller.

"Ready to go?" he called, and I nodded.

"Switches off, fuel on?" he called.

"Dunno, which is on?"

"Oh sorry, 'ein' is 'on' and 'aus' is 'off'."

"OK, switches off, fuel on," I chanted.

He pulled the propeller through several revolutions before calling, "Throttle set?"

"Throttle set."

"Switches on. Contact!"

"Contact!" The engine started on the first attempt and he removed the chocks and clambered into the front cockpit.

Following his instructions, I taxiied out and performed a full circuit and landing. The Hirtenberg handled just like a Tiger Moth, and my landing was smoother than many I'd done in Tigers.

"Very nice. OK, old chap, I've got her," my instructor shouted over his shoulder, and we taxiied back to the hangar to beckon my friend over.

"OK, she's all yours," the instructor shouted, once my passenger was secured. "Take her away and try a few turns, then come back and try a circuit once you feel confident enough."

He waved me away and I taxiied out to the grass runway.

After take-off, I climbed to 1000 metres. My passenger was ecstatic at being airborne and asked me to perform some aerobatics, which posed a problem because I'd never learned aerobatics, only spins and stalls.

So I levelled out and closed the throttle to demonstrate a stall. It proved similar to the Tiger's – very gentle – which didn't satisfy my fare-paying passenger, who demanded a bit more excitement for his money. So not wishing to upset him, I closed the throttle again and announced I would now demonstrate a spin.

He let out a *whoop* when the aircraft suddenly surprised us by flicking inverted before entering a fully developed spin.

Photo courtesy of John Parker, abpic.co.uk.

> // My passenger and I were lucky to survive my stupidity. Tragically, the statistics show there are plenty of young pilots who have not. //

I allowed it to do three full turns to give him value for his money before initiating recovery action, which was when I encountered difficulty applying corrective rudder against the excessive air loads, so recovery took a lot longer than in the trusty Tiger Moth.

Then I nearly pulled back too hard on the stick on the pull out because the aircraft shuddered and tried to snap into a spin in the opposite direction. By now the German altimeter indicated less than 200 metres.

I decided this was enough aerobatics for one day and, with shaking hands, set course back to Croydon, despite the indignant protestations of my passenger.

After a cautious circuit and landing, I parked outside the Experimental Flying Group's hangar, and waited to stop trembling.

My instructor greeted me.

"How d'yer like her?" he enquired.

"Fantastic!" My passenger responded delightedly. "We did a spiral dive and a zoom. I loved it!"

"Actually it was a spin," I reassured the instructor. "I took her up to 1000 metres, then did a spin to the left."

I sensed sudden great interest, because several members of the Experimental Flying Group hurried over to stare at me. My instructor asked a few more questions, and became very attentive when I mentioned the excessive rudder loads and the tendency to snap in the opposite direction during recovery.

A small crowd pressed closer to hear my answers.

"Why is everybody so interested in my flight?" I enquired after 10 minutes of interrogation.

"Just building up information for the other members." My instructor pointed to a bold red sign in the centre of the instrument panel proclaiming 'spinnen verboten!'

"We think that means 'spinning prohibited'," he confided conspiratorially.

"So, as you're the first person to spin the Hirtenberg, we're all very interested to hear how she handled."

Hirtenberg G-AGAK crashed at Butser Hill in Hampshire, in February 1958, while the pilot was practising spins.

I look back, knowing what I do now, and shudder at the litany of potentially lethal mistakes I made.

Among them, I:

- was in too much of a hurry to get airborne
- didn't familiarise myself with the aeroplane's handling characteristics and limitations
- performed manoeuvres prohibited in the flight manual
- allowed financial considerations to affect my judgement
- performed manoeuvres beyond my capability and experience
- had insufficient familiarisation with cockpit layout
- didn't brief my passenger or check his security (seat belt)
- allowed my passenger, who was totally ignorant of the danger I was putting us both in, to control things.

My passenger and I were lucky to survive my stupidity. Tragically, the statistics show there are plenty of young pilots who have not.

So, what would I teach today's teenage pilots to minimise the risk associated with a sense of being bulletproof, and an immature desire to please, and establish 'rep'?

I'd tell them to never hurry the preflight checks, and to comply, always, with their preflight briefing.

I'd tell them to familiarise themselves with all controls, switches, and instrument indications.

And I'd tell them to *never* attempt something they hadn't been taught.

DECLARING DANGEROUS GOODS TO ATS

A proposed rule change takes what should already be good practice into regulation.

A recent inflight emergency near Auckland Airport has highlighted how important it is for pilots to notify air traffic services about any dangerous goods on board.

CAA air traffic services specialist Kate Madden says airport emergency services need to know what hazardous and flammable substances they might have to deal with.

"The air traffic controller doesn't have access to that information. So it's the pilot's responsibility, as soon as the situation permits, to pass on any details of fuel and dangerous goods on board.

"In the Auckland incident, the pilot didn't say anything to air traffic control about the dangerous goods being carried, and the controller dealing with the emergency did not ask. So the airport fire service would have been waiting for the aeroplane, but not necessarily ready to respond appropriately to the specific dangerous goods on board."

Fortunately, the aircraft landed safely, but Kate says the incident does illustrate the danger of a break in communication.

"Everyone has a role to play in the transport of dangerous goods, including the freight forwarder completing the documentation properly, and the ground handler making sure they pass that documentation to the pilot."

A proposed change to Part 91 will require the pilot-in-command to inform the appropriate air traffic services unit of what dangerous goods are on the aircraft, as soon as practicable, to assist the emergency services in their response.

That rule is expected to come into force later in 2019.

Client advises content to air cargo agent	**Air cargo agent** declares hazardous items to cargo terminal operator (CTO) in a 'shipper's declaration for dangerous goods'	**CTO** provides 'Notification to captain' (NOTOC) detailing nature of any dangerous goods	In an inflight emergency **pilot** advises ATS of dangerous goods on board	**ATS** passes that information to airport emergency services	A fully informed **airport emergency services** chooses appropriate procedure and material to deal with any potential fire

// Responsibility for firefighters knowing what they're up against in a potential fire triggered by a dangerous good in an emergency landing doesn't begin and end with the pilot. It starts with the person originally shipping the goods.

APPROACH19 Australasian PBN Forum

02–03 April, Wellington

The NSS team, including Airways and Aeropath, will come together again to present Approach 19, following on from the success of Approach 18. Targeted at Part 135 and Part 91 operators, training organisations, avionics shops, LAMEs, and air traffic controllers, this two-day seminar at the CAA will bring you up-to-date with all things Performance-Based Navigation (PBN).

Presentations will include a focus on how to develop standard operating procedures for commercial operators; operating in a PBN environment as a Part 91 IFR flier; obtaining a PBN approval; and the roll-out of PBN routes and procedures. There will be something for everyone.

For more information, and to register, visit www.nss.govt.nz/events.

Stay up-to-date with PBN

Did you know you can receive email notifications when there are PBN updates on the CAA website? To subscribe, visit www.caa.govt.nz/subscribe. You can select what lists you would like to subscribe to, including the PBN and New Southern Sky notification lists.

BE WIRE AWARE

Even in remote areas, you need to be aware of, and report, potential wire danger.

Wires are a significant hazard within New Zealand's navigable airspace. In the past five years, there have been 28 wire strikes reported to the CAA.

Overhead wires, power and telephone lines, aerials, and cables are a serious threat to any aircraft flying at low level (under 500 ft). Agricultural aircraft, both fixed wing and helicopter, are especially susceptible due to the nature of the work they do.

Before flying, ensure you plan for, and are aware of, potential hazards. Keep up-to-date with *AIP New Zealand* which advises the location and maximum height of hazardous overhead wires. Keep in mind that farm wires aren't advised in the AIP.

Three places to be particularly vigilant about wires are:

- below 500 ft AGL over flat terrain
- over water – especially crossing rivers
- any time you're operating below the ridgetops.

Remember, the safest way to cross wires is to overfly them at, or near, a supporting structure. This is because the structures are more easily identifiable than the wires. But if overflying a structure is not practicable, you should maintain an altitude at least as high as the structure.

If you come across potential wire hazards, it's a good idea to talk about them directly with the landowner, if possible. Alternatively, get in touch with the 'Down to the Wire' and 'Let's Get 'Em Down' campaigns, who can work with farmers to remove wire hazards. 'Down to the Wire' has 30 industry ambassadors around the country who can answer questions on wires.

For more information on wire hazards, including past *Vector* articles, and to download the *Wire Strike Information Sheet*, visit www.caa.govt.nz/wires.

ANTIHISTAMINES AND DROWSINESS

When it comes to treating seasonal allergies like hay fever, pilots should be very careful about anything that contains antihistamines.

A 2011 FAA study highlighted this when it found sedating antihistamines were the most commonly detected medication in fatal accidents.

"Part of the problem is there is a chunk of antihistamines sold on the market as non-sedating, but they are not compatible with flight safety," says CAA Senior Medical Officer Claude Preitner.

Steroid nasal sprays are preferable because they don't affect the whole body. They need to be used regularly as they take a few days to take effect.

If oral medication is needed, the CAA specifically allows three antihistamines: Loratadine, Desloratadine and Fexofenadine.

"These are the only three which don't cause drowsiness. A pilot can take them and fly, assuming there is no other background medical condition that could be a show stopper," says Claude.

Pilots should still test them long before flying to check whether they have any negative reactions.

Any other antihistamines must not be used within 48 hours before flying.

Claude says some antihistamines are traditionally seen as non-sedating but still cannot be used.

"Cetirizine is commonly prescribed by GPs. Although labelled non-sedating, they are sedating enough to be incompatible with flying, and not all GPs necessarily know that."

Claude says if there is any doubt, or a pilot has had a change of medical condition that warrants the use of medication, they should talk to their medical examiner, who is trained in aviation medicine.

"They can tell you if something is okay, or they could say 'if you take this you need to ground yourself'. If the pilot prefers to engage directly with CAA, they can do that too."

For medical enquiries email: med@caa.govt.nz, or call the aviation medicine team on 04 560 9466.

// KEEPING YOUR CONTACTS UP-TO-DATE

Moving house is always exciting. Having to tell everyone about your new address is a bore. But where your 'address for service' is concerned, it's an obligation under the Civil Aviation Act 1990.

Out-of-date contacts mean critical safety information doesn't reach you, which is why keeping them current with the CAA is a legal requirement.

If you change your address for service – and any telephone or fax numbers, or email addresses you supply when you first apply for your aviation document – you do have to let us know. By law, if the CAA sends a letter to your address for service, you are deemed to have received it.

To avoid problems, just email info@caa.govt.nz, or post the details to CAA, PO Box 3555, Wellington 6140.

If you subscribe to *AIP New Zealand*, you need to contact Aeropath separately, and the Rescue Coordination Centre if you fly an aircraft with a 406 MHz distress beacon.

If you own an aircraft, its Certificate of Registration may be invalidated by out-of-date contacts, which may affect your insurance cover. To update your details email aircraftregistrar@caa.govt.nz.

So save yourself some grief, and put the CAA on your list of the people who need to know you've moved.

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 Aeropath on 0800 500 045, or their website, 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 website. Printed copies can be purchased from 0800 GET RULES (0800 438 785).

AVIATION SAFETY ADVISORS

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

Don Waters – North Island
027 485 2096 / don.waters@caa.govt.nz

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

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

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

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 temporary airspace or an AIP Supplement – the two applications must be made separately. For further information on aviation events, see AC91-1.

For more, see **www.caa.govt.nz/general-aviation/aviation-events/**.

CAA cut-off date	Aeropath (Airways) cut-off date	Effective date
13 Mar 2019	20 Mar 2019	23 May 2019
10 April 2019	17 Apr 2019	20 Jun 2019
08 May 2019	15 May 2019	18 Jul 2019
05 June 2019	12 June 2019	15 Aug 2019

See **www.caa.govt.nz/aip** to view the AIP cut-off dates for 2019.

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 website, **www.caa.govt.nz**, "Accidents and Incidents". Some accidents are investigated by the Transport Accident Investigation Commission, **www.taic.org.nz**.

Hughes 369D	
Date and time:	05-Feb-2015 at 11:00
Location:	Kaituna Bridge
POB:	1
Injuries	1 minor
Damage:	Destroyed
Nature of flight:	Other aerial work
Pilot licence:	Commercial pilot licence (H)
Age:	47 yrs
Flying hours (total):	3109
Flying hours (on type):	851
Last 90 days:	104

While refilling the monsoon bucket during firefighting operations, one of the four strops attached to the bucket got caught around the left rear skid, which had been fitted with a snow shoe. The pilot descended to release tension, and the current carried the bucket downstream. This pulled the aircraft out of its centre of gravity, causing tail rotor strike. The aircraft spun around several times uncontrollably, ending up on its side in shallow water on the river bank.

CAA Occurrence Ref 15/387

Piper PA-28-181	
Date and time:	08-Feb-2018 at 17:15
Location:	Papakura
POB:	2
Injuries:	2 minor
Nature of flight:	Training dual
Pilot licence:	Private pilot licence (A)
Age:	22 yrs
Flying hours (total):	339
Flying hours (on type):	106
Last 90 days:	53

Following a go-around the aircraft suffered a power loss. The aircraft attitude was reduced at which point partial power was regained for approximately three seconds. During the ensuing forced landing, the aircraft contacted a fence. The cause of the power loss has not been able to be identified.

CAA Occurrence Ref 18/484

Neico Aviation Lancair 320	
Date and time:	14-Mar-2015 at 12:10
Location:	Kinloch
POB:	1
Injuries :	0
Damage:	Destroyed
Nature of flight:	Private other
Pilot licence:	Recreational pilot licence (A); private pilot licence (A)
Age:	72 yrs
Flying hours (total):	1200
Flying hours (on type):	600
Last 90 days:	5

The aircraft was conducting a private VFR flight. At approximately 4000 feet, a "sudden, major vibration up front" was experienced. The pilot immediately declared a MAYDAY on the local traffic frequency. The MAYDAY was heard by another pilot, who relayed the distress call to the air traffic controller who in turn notified search and rescue.

The pilot closed the throttle and located a topdressing strip within gliding range. The pilot landed the aircraft safely, but was unable to stop in the distance available, and the aircraft continued into the top of trees beyond the end of the strip. The pilot was not injured, but the aircraft was destroyed.

Subsequent inspection found that one of the Aerotek VP AP406 propeller blades had separated completely from the hub and was missing. This occurred at a normal RPM setting in the cruise. The remaining three blades remained secure in the retention ferrules. The pilot reported that the preflight checks were completed, which included checking each blade for movement or play. No abnormalities were detected in the preflight.

Aerotek stated that they changed their supplier of blade timber in 2000, due to concerns about quality. Aside from this aircraft, these wooden propellers had been used only on Rotax engines, and no problems had occurred. It was only when fitted to Continental or Lycoming engines (such as in this aircraft) that the problems with vibration occur. In this case, they believe a failure in the timber resulted in the separation, which may have occurred if the blade had dried out while it sat for months before fitting.

Blades AC200, AP306, AP308, AP332, and AP430 apply to Rotax engines and there have been no reported issues. Given this is the only aircraft in this engine/blade configuration, and it has not affected other aircraft, there is no further CAA action proposed in respect of these propellers.

CAA Occurrence Ref 15/1101

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 website, **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

Hughes 369D

Power supply to circuit breaker

During avionics fault finding, the particle separator bypass light power supply wire was found to have shorted to ground. This caused the wire to overheat, and burn itself and surrounding wires in the loom it was situated in.

A remotely-mounted 1 amp circuit breaker had been installed to power the particle separator bypass light. Due to the wire being connected directly to the battery bus, when a short occurred, the wire overheated and burned until continuity to ground was lost. The circuit breaker was relocated to an unused position on the circuit breaker panel. All burnt and damaged wiring was replaced as per FAA AC43.13-1B and AMM.

CAA Occurrence Ref 18/5755

Aerospool Dynamic WT9

Prop gearbox

Part model:	914UL2
Part manufacturer:	Rotax
Part number:	914UL2
ATA chapter:	7210
TSI hours:	450
TTIS hours:	450

The engine suddenly increased in RPM during take-off and did the same in two subsequent test flights. The aircraft was new and there was no record of any previous engine or gearbox strip-downs.

The engine monitoring data was downloaded and 16 alerts for overspeeds were found. During the maintenance investigation of the gearbox, signs were found of internal damage and potentially incorrect assembly. It was noted that only two of three inline disc springs (p/n 838216) were fitted, which was suspected as the cause of the RPM fluctuations. It was also noted that there was no spacer ring (p/n 926022) fitted between two oil seals. This Rotax engine was a non-certified engine type.

An extensive investigation by CAA could not determine whether these parts were omitted during manufacture, which is considered unlikely, or removed by an unknown party during an unrecorded maintenance visit.

CAA Occurrence Ref 18/478

Pacific Aerospace Cresco 08-600

Rear spar lower cap

Part manufacturer:	PAL
Part number:	08-30023-1
ATA chapter:	5500

While carrying out disassembly of the tailplane due to accident damage, the rear spar p/n 08-30015-1, lower cap p/n 08-30023-1, was found to be cracked at the lower attachment to the fuselage.

Further technical investigation was conducted to determine the origin of the cracking. The investigation determined that, due to the orientation of the fracture face at 45 degrees, and the lack of apparent beach marks, fatigue was not a contributing factor. The position of the fracture in relation to the permanent deformation of the spar cap indicated that the fracture was a result of the impact forces associated with the accident.

CAA Occurrence Ref 18/478

Kawasaki BK117 B-2

Emergency release system

ATA chapter:	5200

The left sliding door fell out during a maintenance test flight, landed on the grass, and was slightly damaged. The investigation revealed that both the emergency release latching pins and their associated mechanisms were worn and dirty, and that in one in five tests, the latching pins were not travelling their full distance.

The OEM requires a check of the operation of doors and windows every 600 hours. The nature of this issue and the inability to see the latching pins when the door is in place, however, made it unlikely the problem would have been identified. The operator will review their inspection schedule in this area, specifically to include disassembly, cleaning, wear checks, and full functional checks of that mechanism.

CAA Occurrence Ref 18/4747

AVIATION SAFETY OFFICER COURSE

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

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

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

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

Auckland 07–08 March 2019
Jet Park, Auckland Airport

Wellington 04–05 April 2019
CAA, Level 15, Asteron Centre

Queenstown 23–24 May 2019
Copthorne Queenstown Lakefront

Tauranga 04–05 July 2019
The Tauranga on the Waterfront

Hamilton 26–27 September 2019
Novotel, Hamilton Tainui

Christchurch 31 October – 01 November 2019
Sudima, Christchurch Airport

AIRWORTHINESS AND MAINTENANCE WORKSHOP

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

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

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

Wellington 09–10 April 2019
CAA, Level 15, Asteron Centre

Queenstown 21–22 May 2019
Copthorne, Queenstown Lakefront

Tauranga 02–03 July 2019
The Tauranga on the Waterfront

Palmerston North 20–21 August 2019
Hotel Coachman

Hamilton 24–25 September 2019
Novotel, Hamilton Tainui

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

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

Dangerous Goods

KEEP YOURSELF SAFE. ASK YOUR AIRLINE.

LPG bottle

Lighter fluid

'Strike anywhere' matches

Fireworks

Bleach and poisons

Blue flame and single-action lighters

Batteries and powerbanks

Camp stove

Ammunition

E-cigarettes, lighters, and safety matches

Aerosols

Chainsaw and other tools

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

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

For more information, visit **www.caa.govt.nz/dg**

New Zealand Government