March/April 2016

POINTING TO SAFER AVIATION

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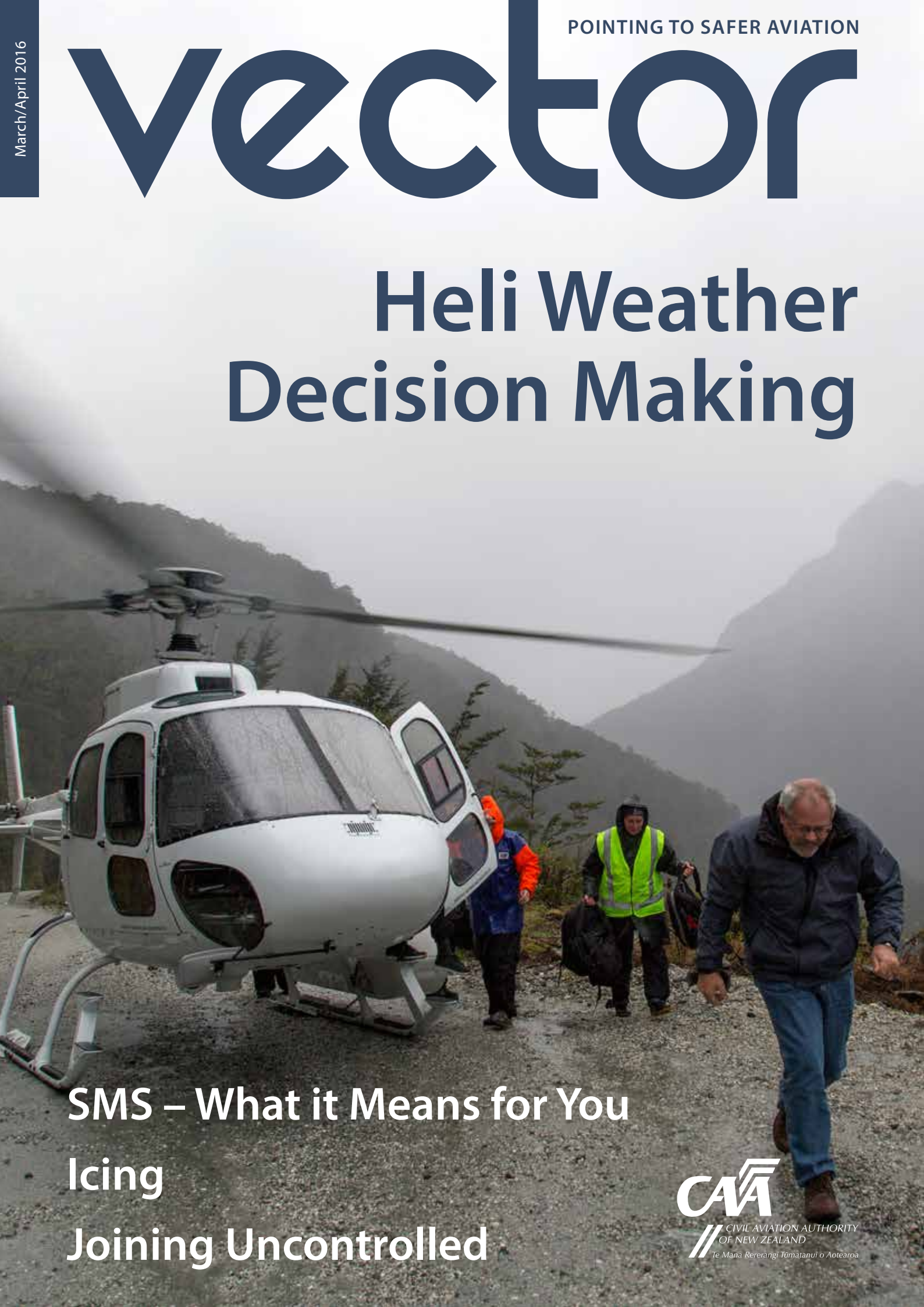
Heli Weather Decision Making



SMS – What it Means for You

Icing

Joining Uncontrolled

CAA
CIVIL AVIATION AUTHORITY OF NEW ZEALAND
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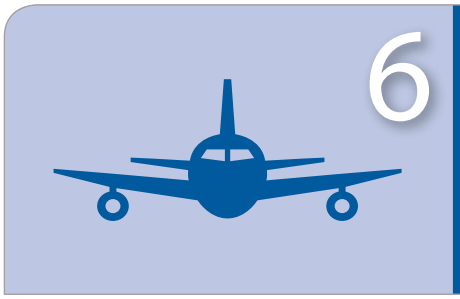
4 Heli Weather Decision Making

Confusion exists around the applicability of weather minima under Parts 91 and 135, and the conditions attached to a Special VFR clearance. It's contributing to a high accident rate in the rotary sector.



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New rules mandating Safety Management Systems became effective 1 February 2016. We outline what this means for you.

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Whether ice accumulates in your carburettor or on your airframe, it can have a huge effect on aircraft performance.

16 Joining Uncontrolled

The key to a successful circuit join is situational awareness. If you lose it, remove yourself from the circuit and give yourself time to re-build the picture.

Cover: Even though the weather minima might be suitable to commercially transport passengers VFR on departure, make sure you maintain the required minima enroute.

Photo: istockphoto.com/jax10289

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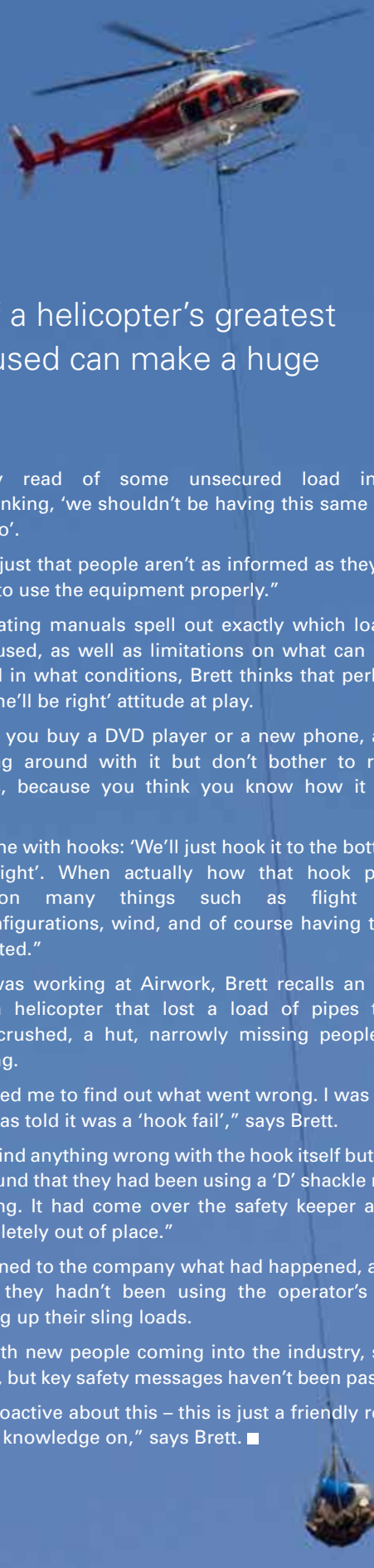
Hooking in to External Load Safety



The ability to winch people and cargo is one of a helicopter's greatest assets. But something as simple as the hook used can make a huge difference to what happens to that cargo.

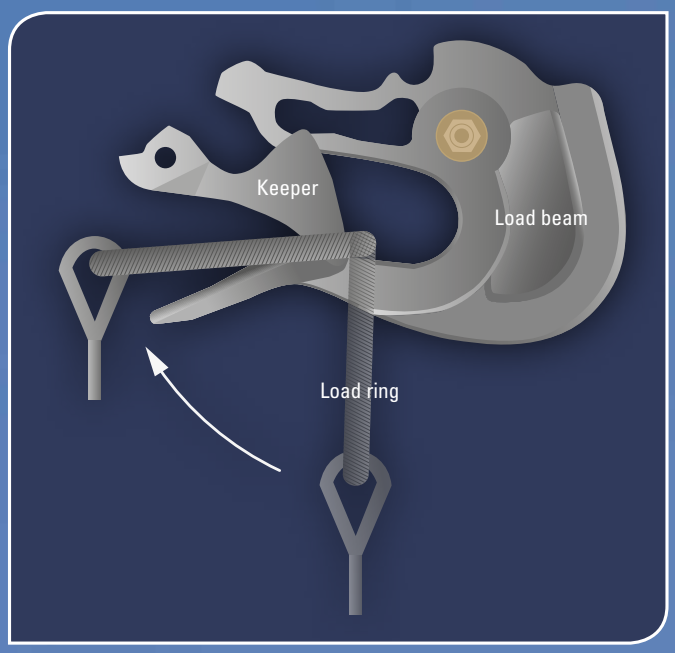
During the late 1990s and early 2000s, maintenance engineer Brett Purchase was heavily involved in helicopter rescue winches and cargo hook repairs, because he worked at Airwork, and a major American helicopter hoist and winch provider, Breeze Eastern.

"Back then, we had some issues with uncommanded sling load releases on helicopters we had operating at mines in Papua New Guinea and Indonesia. But when investigating these hooks, I was finding nothing wrong with them," says Brett.

"What it came down to was the sling loads not being secured using the correct load rings.

"That was a relatively known issue, especially after fatalities in the United States. Safety conferences I went to back then addressed the danger of having hooks whose keepers aren't 'pit pinned', or the danger of using the incorrect rings on cargo hooks."

Brett left aviation for some years, but was shocked on returning to the industry, five years ago, when he heard of several similar cases happening in New Zealand.



If your load ring is the wrong size, it could flip over the load beam and then move in against the keeper, forcing the keeper to rotate, allowing the ring to slip off, taking your load with it.

"I recently read of some unsecured load incidents, and was thinking, 'we shouldn't be having this same issue as 20 years ago'.

"I think it's just that people aren't as informed as they should be on how to use the equipment properly."

While operating manuals spell out exactly which load rings should be used, as well as limitations on what can be sling loaded, and in what conditions, Brett thinks that perhaps it's that Kiwi 'she'll be right' attitude at play.

"Like when you buy a DVD player or a new phone, and you start playing around with it but don't bother to read the instructions, because you think you know how it works," says Brett.

"It's the same with hooks: 'We'll just hook it to the bottom and she'll be right'. When actually how that hook performs depends on many things such as flight angles, loading configurations, wind, and of course having the right load ring fitted."

When he was working at Airwork, Brett recalls an incident involving a helicopter that lost a load of pipes that fell onto, and crushed, a hut, narrowly missing people in the next building.

"They wanted me to find out what went wrong. I was sent the hook and was told it was a 'hook fail'," says Brett.

"I couldn't find anything wrong with the hook itself but digging deeper, I found that they had been using a 'D' shackle ring that was too long. It had come over the safety keeper and then slung completely out of place."

Brett explained to the company what had happened, and then discovered they hadn't been using the operator's manual when setting up their sling loads.

"Maybe, with new people coming into the industry, some of these small, but key safety messages haven't been passed on?

"Let's be proactive about this – this is just a friendly reminder to pass this knowledge on," says Brett. ■

Photo: istockphoto.com/lilly3

Heli Weather
Decision Making

There's evidence that some air transport helicopter operations are carrying out Part 135 operations using the less stringent Part 91 weather minima. Is it ignorance? Pressure to make a dollar? Either way, it's contributing to a high accident rate in the rotary sector.

Recent occurrences have shown that pilot knowledge regarding weather minima is a bit hazy. Confusion exists around the applicability of weather minima under Parts 91 and 135, and the conditions attached to a Special VFR clearance.

Here's a potential scenario:

> You're flying from Christchurch to Rangiora to pick up a wedding party and take them to a lodge for their reception. You fly out to them in marginal weather under Part 91, but what do you do after you land?
>
> (a) Decline the flight because with passengers you're now a Part 135 pilot and the weather is below minima?
>
> (b) Continue to fly the passengers because you set out under Part 91?
>
> (c) Because you have passengers, you are now flying under Part 135, but you have a bona fide reason to continue flying?

If you picked (b) or (c), think again. When transporting fare-paying public, stricter minima under Part 135 apply.

"I'm very aware that many, many rotary operations are flying passengers VFR in weather that, under Part 135, would prohibit them from doing so," says Mitch Jones, CAA Flight Operations Inspector.

"It's quite simple. When you're carrying passengers, you cannot fly lower than 500 ft agl, nor with a cloud base of less than 600 ft agl.

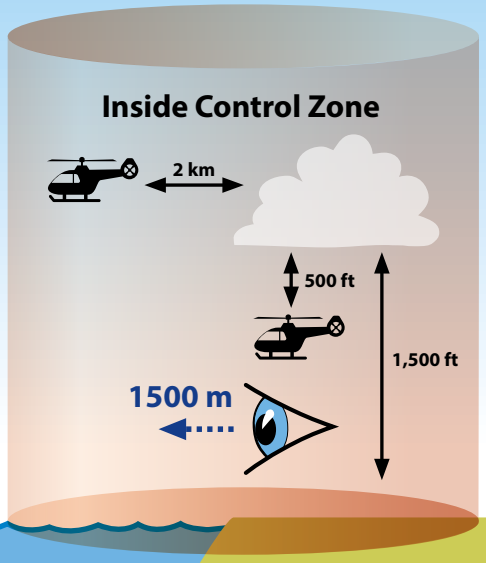
"Additionally, operations under Part 135 must maintain the 1500 metres visibility. In terms of legality, that's just as important as the cloud base," says Mitch.

Even if weather is suitable for flying under Part 135 on departure, if visibility deteriorates during flight – say, due to rain – then you'll need to put your plan B into action. A number of catastrophic accidents have occurred as a result of 'press-on-itis' – the pilot's reluctance to abort their plan A in deteriorating conditions.

Part 135 Helicopter VFR Met Minima

SPECIAL VFR

Less than 600 ft ceiling and less than 1500 m visibility if the helicopter is operated at a speed that will give adequate opportunity to observe other traffic or any obstructions in order to avoid collisions. Applicable to the control zone **only**.



If you do breach the minima, you'll need to fill out a CAA Section 13A form and let the CAA know as soon as possible. The 13A must be completed by the pilot-in-command, or the operator of an aircraft, to report a breach of a civil aviation rule.

"But don't think of the 13A as a 'get-out-of-jail-free' card. All 13A forms submitted are scrutinised," Mitch continues.

"Also, if you get caught out by changing weather, flying VFR above the clouds should always be the last resort. You can fly VFR above cloud only if the cloud is scattered (up to three to four oktas, providing plenty of opportunity to see the ground). If the cloud is broken or overcast, then VFR above cloud isn't even an option."

Bona Fide Low Flying

"If you are carrying fare-paying passengers under Part 135 on commercial transport operations, you cannot fly lower than 500 feet above ground level unless you have a bona fide reason or an emergency," says Jason Frost-Evans, another CAA Flight Operations Inspector.

"It's also important to remember that the minimum heights for VFR are quite separate from the weather requirements.

"Actual bona fide situations that require low-level flying don't trump the need to comply with weather minima.

"And conversely, a change in weather conditions in-flight is never a bona fide reason for low flying. If you have a bona fide reason, there's formal planning, risk assessment, and notifications involved."

An example of a bona fide Part 135 operation requiring flight under 500 ft could be a powerline inspection or photography flight.

"A good test to determine if the activity requires bona fide low-level flying, is to ask yourself, 'if it was a perfect day, could I conduct the operation above 500 feet?' Weather shouldn't be a determining factor."

Special VFR Control Zone Only

Special VFR is a tool air traffic controllers (ATCs) have at their disposal to get pilots in and out of a control zone when weather conditions fall below visual meteorological minima. It can be used in the day only, and is subject to ATC discretion.

However, the special VFR clearance applies to the control zone **only**, where controllers can take responsibility for aircraft separation.

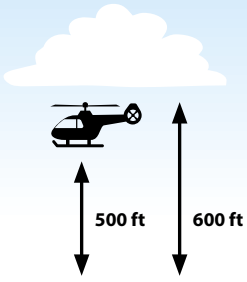
Mitch Jones says, "We see examples of pilots who continue to fly under special VFR outside of control zones. The special VFR clearance doesn't absolve the pilot from complying with the required Part 91/135 minima after leaving the control zone."

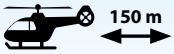
Part 91 Operations

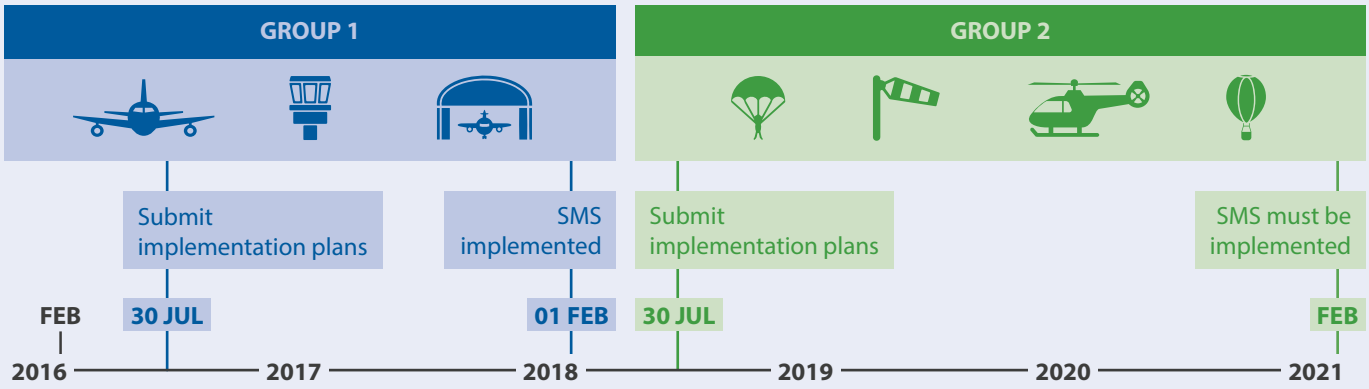
Pilots flying below 1000 ft agl, and 3000 ft amsl under Part 91, can fly clear of cloud and in sight of the surface while outside controlled airspace (provided they comply with the minimum height rules). But as the saying goes, "there's nothing as useless as the sky above you".

"We have a culture of people flying low, and it's a huge issue," says Mitch.

"Why do pilots insist on flying around in beautiful weather in single engine machines at 501 feet? At that height, there's not a lot of fudge factor. If the engine quits, there isn't much time to make decisions and plan your escape route, or set the aircraft up for the emergency. Consider that helicopters can take up to 1500 ft of autorotation before the autorotative forces become fully established on the aerofoils." ■







Actual implementation of SMS dependent on various factors – see article

SMS – What it Means for You

The rules mandating Safety Management Systems became effective on 1 February 2016. That means most organisations have to have a CAA-approved set of procedures and processes to identify hazards and deal with their associated risks.

"There's no doubt that the introduction of SMS is one of the biggest improvements to safety in civil aviation, possibly since the Civil Aviation Act in 1990," says Mark Hughes, CAA's General Manager of Air Transport and Airworthiness.

"While compliance to rules has worked well in the past, things like an increasingly diverse mix, higher density of air traffic, and the complexity of some of the automation, is increasing risk in the sector. So if we just stay with compliance to rules, our safety record will get worse."

So what is a Safety Management System and what do you do next?

"SMS is about asking 'what are the hazards that could affect our operation? How can we manage their associated risks?' It's about reducing the risk of harm to people and property to as low as is practicable," says Mark.

Many organisations will have elements of an SMS in place because it builds on an already-established Quality Management System.

For instance, does your organisation have a written-down, widely-communicated and well-maintained safety policy?

Before you start any new activity, do you identify safety hazards, and evaluate the risks that are involved?

If you say 'yes' to those questions, you already have the basics of an SMS in place.

"Otherwise, you could start by having a staff brainstorming session," says Mark Hughes. "Get everyone to identify the hazards they're aware of, because of where they work and what they do. Then consider the risk to safety that these hazards pose to the operation.

"Pull together all the data you have on occurrences in your operation. That will be one indicator of where you need to concentrate your time and energy. If you don't have much of that sort of data, go to other operators and ask them about the hazards they've identified."

The CAA has a series of booklets on building a Safety Management System, email info@caa.govt.nz for a free kit. CASA in Australia also has guidance – go to www.casa.gov.au/sms.

For more information about SMS, including Advisory Circulars, where to send questions, how to receive email updates, and training, go to our web site, www.caa.govt.nz/sms.

Who and When?

Existing participants under Parts 121, 125, 145 (those supporting 121 and 125 operators), 139 (those supporting international operations), and the 170 series are required to have their SMS Implementation Plans in to the CAA by 30 July 2016.

Each of these operators will then propose a date they will be ready to fully implement their SMS. The final date they can propose is 1 February, 2018.

The CAA will then review the Implementation Plan and the proposed date. A confirmed date for implementation will then be set by the CAA, taking into account:

- the date proposed by the organisation
- the date the organisation's certificate is to be renewed
- the capability and complexity of the organisation
- the risks inherent in its activities
- the workload of the CAA and the organisation.

Existing participants under Parts 115, 135, 137, 141, 145 (those supporting other than 121 and 125 operators), 139 (those not serving international operations), 146, 147, and 148 are required to have their Implementation Plans in to the CAA by 30 July 2018, and their SMS up and running by 1 February, 2021.

The same process applies to this group, in terms of getting a date approved for implementation, as to the first.

Applicants for a new organisational certificate submitted after 1 February 2016 should refer to Annex F, AC100-1 (Rev 1) for the options available to them.

For more about managing risk as part of a Safety Management System, go to page 7. ■

Icons: istockphoto.com/glorcza, istockphoto.com/iLexx

Risk – Where to Begin

Implementing a Safety Management System for your organisation is now a rule requirement for most organisations. For some of you, there's not much more than 16 weeks to have SMS plans in to the CAA for approval.*

What's in it for you?

Establishing a Safety Management System (SMS) provides a simple and co-ordinated approach to preventing undesirable events, including accidents.

No 'undesirable event' is without cost, so a robust SMS leads to a more profitable business. There's an old saying, "If you think safety is expensive, try having an accident."

A good safety record enhances the reputation of your organisation, and a safe working environment helps to minimise staff turnover, which is another cost saving.

Start by Identifying Hazards

Hazards are objects or conditions that could cause injuries to staff, damage to equipment or structure, loss of material, or a reduction in the ability to perform a function.

Hazards are as varied as fatigued pilots, inadequately completed tech logs, and insufficient staff chasing tight deadlines.

Under SMS, staff *proactively* identify hazards, rather than only dealing with their effects after the event. That can be done by analysing occurrence data for instance, or surveying all employees, or holding a brainstorming session with key staff.

Mike Groome, the Chief Executive Officer of the Taupo Airport Authority advises organisations still developing their SMS that it's critical all possible stakeholders are engaged in the process.

"This isn't necessarily only those directly involved in your operation, but anyone who is affected, or affects safe outcomes. Get them all in a room and talk!"

Managing Risk

Risk management is not the same as hazard identification. A hazard is something that can cause harm, and risk is the potential outcome of that hazard. For example, an uneven runway surface would be considered a hazard, but the risk comes from operating on that runway.

Risk is the likelihood of something happening, combined with the severity of the consequences if it does. One way of assessing risk is to design a matrix, such as that on page 9.

A matrix doesn't need to be drawn up for all organisations however. Smaller scale operators might just rank their risks according to what they believe is the highest.

Not all risk can be completely eliminated, but it can be managed by ensuring it remains at an acceptable level. That involves reducing the likelihood of it occurring, or the impact of the consequences if it does.

Continued over ››

Never assume that the absence of accidents indicates an organisation has robust 'safety health'.

Photo: Granger Historical Picture Archive

When anyone asks me how I can best describe my experience in nearly 40 years at sea, I merely say uneventful … I have never been in an accident of any sort worth speaking about … I never saw a wreck and have never been wrecked, nor was I ever in any predicament that threatened to end in disaster of any sort.

Captain Edward John Smith, RMS *Titanic*

*See 'SMS – What it Means for You' page 6.
Also see 'New Responsibilities for Worker Safety' page 21.

» Continued from previous page

Doing something about it

"I visited an operator recently," says Steve Backhurst, a CAA Airworthiness Inspector, "and as we entered the hangar office, my host said 'oh, mind the step' indicating a step up into that area. They'd obviously identified that step as a hazard, but had done nothing about it, other than to tell people to 'watch out' for it."

Once a hazard has been identified, it needs to be eliminated, or the degree of risk it presents minimised. In the case of the step, that could be done by building a ramp over the top of it, or by erecting a large and obvious sign next to it, or by the front edge being painted a bright colour.

"A Safety Management System is only as good as the degree to which hazards are dealt with," says Mark Hughes, CAA's General Manager of Air Transport and Airworthiness.

"If there's little follow-up, everyone's relying for safety on something that does not actually exist. They think everything must be okay because hazards have been identified.

"The SMS can even be nicely written down, but if it's not enforced and practised, the end result is the same as if there was no SMS.

"In fact, it's worse than knowing that you don't have any kind of SMS, and need one."

Dependence on Good Reporting

"A strong Safety Management System relies on data," says Mark Hughes. "And that data comes from staff not just reporting the large incidents, but also the small things, like poor lighting in the maintenance area, constant disruption to tasks by having to answer the phone, or a pilot's regular rushed fuel handling at the pump.

"Good reporting helps to identify weaknesses in the system. Conversely, someone who doesn't report is depriving the organisation of the opportunity to prevent an accident. Everyone has an obligation to report."

At Air New Zealand, reporting was made easier by the introduction of the Korusafe online database. All staff use the system for submitting safety reports.

Reports are then collectively reviewed by the safety team, receive an operational risk classification, and actions are tracked to completion through the same system.

It's also possible for the submitting staff to see the progression of their report through the database.

Encouraging Reporting

Staff are not going to report any genuine mistakes, or events arising from them, if senior management humiliate or penalise them for it.

A management culture recognising that human errors occur, and that lessons can be learned from them, will encourage staff to report.

As Mark Hughes says, "In the same way that employees have an obligation to report, it's the responsibility of management to create the right atmosphere for reporting."

Risk is Dynamic

Identifying *today's* hazards, and assessing and dealing with *today's* risk, is not the end of the process.

Risk ebbs and flows, depending on the working environment: staff numbers fluctuate; an operation carrying little risk in summer might carry more in winter; the introduction of new technology presents higher risk if staff are not properly trained to use it. All such factors influence the nature, and degree, of risk to an operation.

Undertaking regular reviews of risk, as well as at high-risk times, will keep an SMS robust. Times of higher risk would include periods of major expansion, or major staff changes.

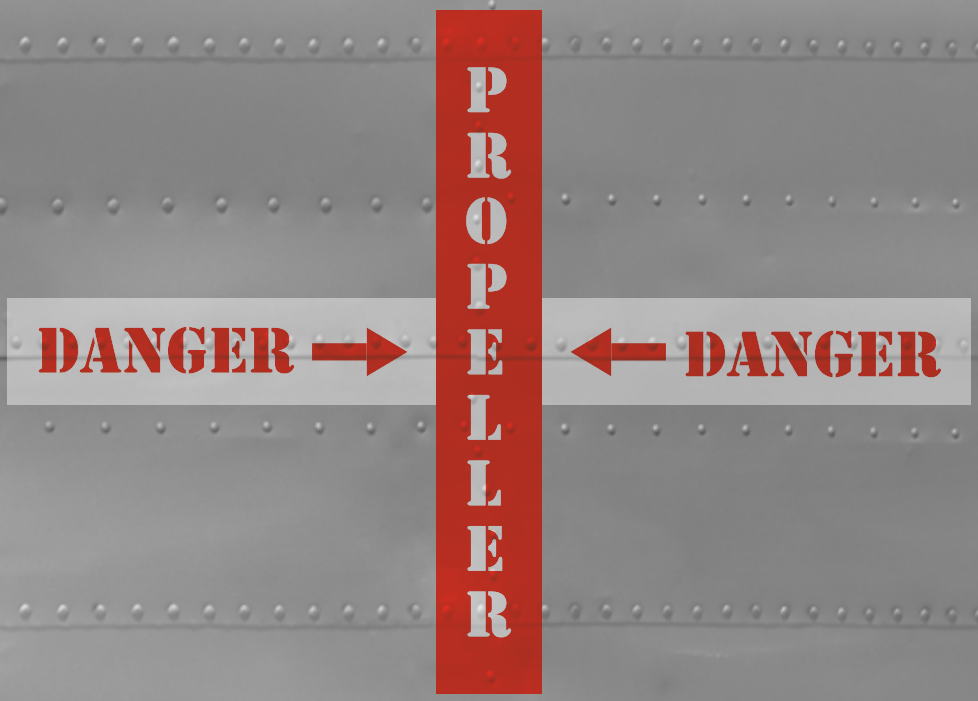
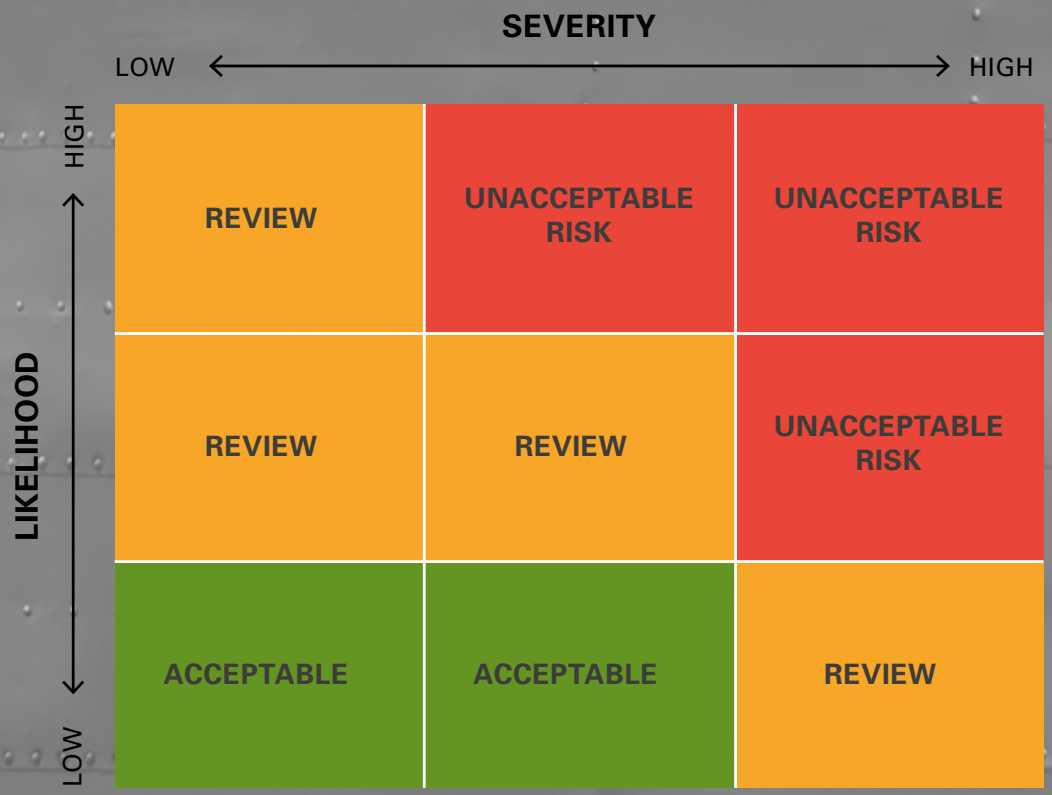


Photo: istockphoto.com/jimclark1947



This type of risk matrix combines the likelihood of an event happening with the severity of the consequences if it does. Those potential events that score high on both are the ones that pose an intolerable risk. Those that score low on both can probably be lived with. Some that are high on one, and low on the other, or that are middling on both, should be reviewed regularly to ensure the risk they pose has not changed.

Similarly, an ongoing exchange of safety information between management and employees will help everyone understand the state of safety in the organisation, and their role in maintaining it.

One way Massey School of Aviation has ensured that it is continually improving safety is through using an external analyst to identify and measure any 'gaps' in the school's SMS.

That has provided the school with a prioritised list of what needs to be improved, and the use of someone outside the organisation has given it a more objective result.

Put someone in charge … but don't leave them to it

Someone – appropriately qualified – needs to have oversight of the whole SMS. That doesn't mean, however, only one person has responsibility for hazard identification, reporting, and risk assessment.

That obligation falls on all employees, from the CEO to the maintenance shop junior.

Ideally, it becomes part of the everyday routine of each employee. It does not stand apart from everything else, but is woven into the fabric of the company. For instance, regularly challenging staff about their understanding of the risks associated with the job they're about to do, or incorporating risks and hazards discussions into regular meetings will help to make SMS part of business as usual.

South Island-based Air Safaris, with 12 staff, has developed a company 'safety culture', led from the top.

"We have regular, formal safety meetings. But with a small close-knit team, we also use the opportunity to discuss, over our daily cuppa in the crew room, safety considerations and any new issues," says CEO, Richard Rayward.

"Safety is embedded in the company ethos. It's not just the pre-winter and pre-summer briefing, day-to-day safety practices are front and centre of every employee's mind."

Nil Desperandum

Paul Kearney, the Quality Assurance Manager for the Massey School of Aviation says operators should take heart that developing an SMS is easier than it looks.

"A lot of organisations may worry that there is an insurmountable amount of work in implementing an SMS. However, for those with Quality Management Systems already, it's mostly done."

And Stephen Burrows, Oceania Aviation's former Group Quality Manager, says to keep it simple.

"Try to reduce the number of systems, processes and tools so you aren't making things so complex, they're unsustainable. Look around for what's already out there that works and then tailor this for your use."

Richard Rayward of Air Safaris agrees.

"SMS might at first look daunting but keeping it simple and practical for *your* company means staff will understand it and support it." ■

Icing

Icing is a year-round threat to pilots. Whether it accumulates in your carburettor, or on your airframe, it can have a huge effect on aircraft performance.

"People often assume that icing is just a winter issue," says CAA Chief Meteorological Officer Peter Lechner. "But that's not the case at all.

"We live in a temperate maritime country so icing conditions can occur all year round both in the air and on the ground. And ice and flying really don't mix."

The spine of New Zealand's landmass lifts the warm moist air flowing off the Tasman and cools it. This high moisture-content air is perfect for producing ice on aircraft.

Accurately predicting where and how much ice you'll find is difficult, but there are general conditions that make icing more likely.

Having a good knowledge of Met, knowing the air temperature, dew point, and freezing level outside your aircraft will help you predict icing conditions.

Induction System Icing

If you have a carburettor, the two key things that affect icing are the air temperature and the relative humidity.

Basically, when liquid fuel changes to fuel vapour and mixes with the induction air it can cause a large drop in temperature. The venturi effect also cools the airflow. If the carburettor temperature then falls below 0 degrees Celcius, the water vapour condenses into ice.

The classic symptoms of carburettor icing are a reduction in power and an engine running rougher. Unless this is addressed, usually by applying carburettor heat, then the carburettor may freeze up.

When humidity is higher (with more water in the atmosphere) there's a greater risk of icing – and not just in cold conditions. Carburettor icing can be possible in a range of -10 to 30 degrees Celsius.

Knowing the dew point will help you decide if you're likely to experience carburettor icing. The dew point is the temperature where the air is saturated with water. At the dew point temperature, the relative humidity is 100 per cent and water vapour condenses out of the air and forms visible water – dew.

The closer the dew point is to the temperature, the higher the level of moisture in the air. So even if the temperature is 15 degrees Celsius, if the dew point is 14 degrees Celsius, that means there will be significant amounts of moisture in the air, and therefore a greater chance of carburettor icing.

Carburettor icing is less likely to occur during takeoff and climb when the engine is operating at higher power due to a wide throttle opening.

If you have a carburetted engine, apply full carburettor heat at regular intervals during the cruise to avoid ice accumulating. The engine may still run roughly for a short time as any ice melts and is ingested.

Removing Ice Pre-Flight

You must remove any ice, frost, or snow from your aircraft before you take off. This isn't just common sense, but is required by rule 91.315 *Operating in Snow and Ice Conditions.*

Encountering Icing Conditions

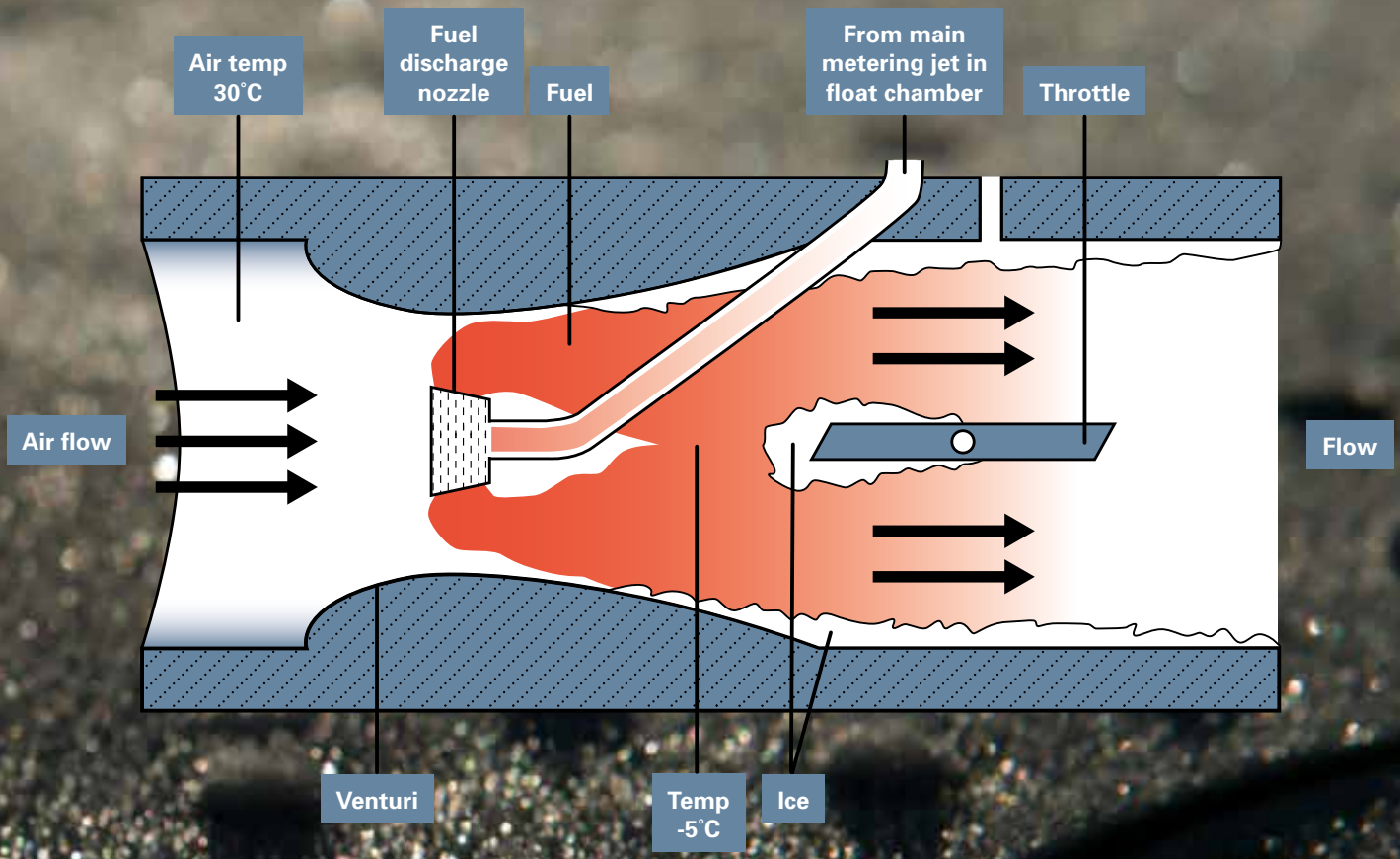
The effects of icing during a flight can be, and have been, lethal. These effects include:

- increased aircraft weight
- increased drag
- loss of lift
- loss of thrust/engine power
- erroneous instrument readings
- loss of control.

Ice build-up on the leading edge can change the actual wing profile leading to reduced lift. It may also increase the speed at which the aircraft will stall.

Usually, general aviation aeroplanes won't be equipped with de-icing technologies. Therefore the pilot must manage any icing risks during flight.

If your aircraft isn't certified for flight in icing conditions, then you must stay clear. Rule 91.421 *Operating in icing*



conditions is very clear about this. Log on to Metflight GA for the latest Met updates so you know where icing conditions are forecast.

Be cautious when flying IFR through a front that may contain freezing rain, freezing drizzle, or other hazardous weather conditions. Even though you may be flying at 5000 ft with icing forecast at 6000 ft, if the icing level descends, then you will need to take action to avoid the icing conditions.

Be aware how quickly icing conditions can affect your aircraft's performance. So if you encounter icing conditions, don't dither, you need to get into clear air as soon as possible.

Helicopter Icing in Flight

For the vast majority of helicopters in New Zealand, there's very little available in the way of ice-protection technology.

"The primary effect of ice on the rotor system is increased drag, followed by a loss of lift due to the change in aerodynamic efficiency of the blade," says Jason Frost-Evans, CAA Flight Operations Inspector – Helicopters.

"The most effective option if you notice icing is to vacate the area, but depending on the rate of accretion you may need to consider landing immediately. Helicopter icing may be evident through deteriorating performance and vibration, as well as visible accretion on the aircraft structure.

"Also, remember that most helicopter types aren't certified for flight in icing conditions and so you may now be operating outside of the flight manual limitations."

Further Information

Icing is a large and complex issue and this article is just an introduction to the basics. For more comprehensive information see the CAA's *Aircraft Icing Handbook* on the CAA web site, www.caa.govt.nz, "Publications – Good Aviation Practice".

You can also get a free copy of the *Winter Flying* GAP booklet by emailing info@caa.govt.nz. ■

Young Eagles Spread Their Wings

The Young Eagles once again impressed at the Flying NZ champs in Ashburton. *Vector* meets five of them who received this year's Ross Macpherson Memorial Young Eagles Flying Scholarships and discusses their dreams for a future in aviation.

The Scholarship awards $2500 each to five Young Eagles to help fund their flight training. Sponsors are Aspeq (ASL), Airways, Aviation and Marine Underwriting Agency, and the Civil Aviation Authority.

This year's recipients were Migael Burger, Bryn Cotton-Tait, Daniel Just, Theodore Vaastra and Alyssa Walker. The five scholarship winners were joined by two other Young Eagles at the champs, Liam Sutherland and Matthew Windurst, as well as Josh Donlea, who, while not old enough to join Young Eagles yet, dreams of becoming a pilot too.

At the presentation dinner, Andrew Crawford from Airways announced a further $500 for each of the scholarship winners from Airways.

"We really want to help young people achieve their dream careers in aviation with this scholarship.

"And we hope that some of them will look into fields of aviation other than being a pilot, such as air traffic control," says Andrew.

Migael Burger

Migael wants to help people. And fly in cool places. He's hoping that with a career in aviation he can do just that with Mission Aviation Fellowship one day.

He's on the cusp of achieving his PPL and has passed all but one of his theory exams.

"Winning the scholarship has been such a help," says Migael. "Learning to fly is costly, especially for a teenager, but it's my dream and what I want to do."

Alyssa Walker

Alyssa lived in Singapore for seven years, and from eight years old was flying home as an unaccompanied minor. So aviation has been with her most of her life.

The same week she found out she'd won the scholarship, she was promoted to corporal in the 13th Squadron at the Air Training Corps.

She's also taking part in a programme at Bridge Pa (Hastings) that credits her NCEA Level 3 and assists her to sit the exams for the theory components of her PPL.

Bryn Cotton-Tait

A helicopter ride in Fiordland at age eight set Bryn on his aviation journey.

"I was really envious of the pilot. I was constantly looking over his shoulder at all the avionics.

"I really enjoy playing around with technology and hope to do more with avionics."

Theodore Vaastra

Theodore fell in love with aviation at Warbirds Over Wanaka, and is especially keen on old military aircraft. He's also a member of the Air Training Corps in Wanganui.

Theodore is almost ready to go solo, and says he recently had a memorable flight lesson on engine failure after takeoff.

"I want to be a pilot for a living. Whether it be transporting people, cargo, or in the military. It's my dream!"

Daniel Just

Young Eagles has opened Daniel's eyes to a range of career opportunities.

"It's been the best thing I've ever done," says Daniel. "Young Eagles has shown me that with hard work and determination, I can achieve my dream of being a commercial pilot."

Nola Pickard Memorial Trophy

Migael Burger took away the Nola Pickard Memorial Trophy, including a $150 flight voucher. This trophy is awarded to the top Young Eagle based on their results in the champs' preflight and defect competitions, as well as the Young Eagles' own general aviation knowledge exam.

Liam Sutherland won the Jean Batten Cup which tests preflight, takeoff, circuits and landing. Aviation is definitely in Liam's career plan. He's so keen that he's already got his first solo booked for his 16th birthday in October. ■

The Young Eagles (from left): Liam Sutherland, Migael Burger, Matthew Windurst, Theodore Vaastra, Daniel Just, Bryn Cotton-Tait, Josh Donlea, Alyssa Walker. They were all treated to a flight over Ashburton in the Tiger Moth.

Reporting **Drone Occurrences**

In 2015, there were 198 occurrences involving drones reported to the CAA, but anecdotal evidence suggests there may be many more. So we need you to report these occurrences so we can direct our actions effectively.

The types of occurrences cover a range of activities, such as drones near aircraft and aerodromes, people not flying their drones in a 'neighbourly' manner, and many complaints about being filmed.

While some councils allow drone operations in public places such as parks, others don't. Flying over a public place such as a stadium can be dangerous.

Already this year, we've had reports of unauthorised drones filming events at Baypark Stadium in Tauranga, and many complaints about drones flying over private property. Mike Campbell, Team Leader of CAA Safety Data Management says the reports are definitely a concern.

"But what's really concerning, are reports we've had of drones being operated near an aerodrome, through a flight path, and within controlled airspace.

"This could so easily end tragically if a drone and aircraft collide. We're very fortunate it hasn't happened yet."

Why Notify?

"Often it's hard to know who the operator is, as drones aren't registered, and you may not see who's operating them," says Mark Houston, Flight Senior Technical Specialist, Unmanned Aircraft and Recreational Aviation.

"However, we still want to be notified about any occurrences.

"Drones are now prolific. We can't be everywhere at once, so we need to know about drone occurrences to know where to focus our attention."

In cases where there is enough information or a public concern, the CAA does investigate and can take action.

"Our number one aim is safety, so where we investigate and find an operator in breach of the rules, we like to take an education-first approach," says Mark.

"Usually it's a case that people don't know the rules and once they do, they're happy to comply.

"But if that doesn't work, or it's a more serious occurrence, then we may look at further action, including prosecution."

How Do I Notify?

You can report drone occurrence online, www.caa.govt.nz/report.

It's quick and easy, and allows the CAA to know where to focus our education efforts.

The drone community will continue to grow and become an important part of the aviation landscape. We want to ensure that every aviation participant is safe. ■

Photos: istockphoto.com/arsat, istockphoto.com/koya

Drones?

We've been calling them drones because this seems to be the term most commonly used at present. Remotely Piloted Aircraft Systems or RPAS is the official International Civil Aviation Organization (ICAO) term for such aircraft. They have also been known as Unmanned Aerial Vehicles (UAVs), and Unmanned Aerial Systems (UAS).

Data – It's Called "Acceptable" for a Reason

The peril of not using acceptable technical data in aircraft maintenance is illustrated by the incorrect repair that was responsible for the world's deadliest single-aircraft accident.

In 1985, a Japan Airlines Boeing 747 ploughed into a mountain near Tokyo, killing 520 people.

Seven years earlier, a tail strike on the aircraft at Osaka International Airport damaged the aircraft's rear pressure bulkhead. The subsequent repair did not conform to the manufacturer's approved repair instructions. That reduced the resistance of the repaired part to metal fatigue.

The incorrectly-repaired bulkhead exploded 32 minutes before the 1985 crash, causing pressurised air to rush out of the cabin and blow the vertical stabiliser off the aircraft, severing all four hydraulic lines, and in turn, causing loss of control of the elevator and rudder systems.

At the other end of the spectrum is this example from CAA's Aviation Safety Adviser Bob Jelley:

"A fabric wing Piper was found to have cracking in the false spar angle and it should have been a simple minor repair.

"The fabric needed to be peeled away, and a length of doubler twice its width used, with the same or next heavier gauge of repair material and the same material spec.

"FAA AC43.13-1B has the appropriate acceptable technical data for such a minor repair.

"But the repair that actually took place just made the problem worse.

"Too much material was used, and the repair was so strong locally, the resulting loads were promptly transferred to the area adjacent to the ends of the doubler, resulting in the false spar cracking at each end of the repair.

"As outlined in the FAA Advisory Circular – which is just one of the sources of acceptable technical data listed in Appendix D to Part 21 and required by rule 43.53 – one doubler of the appropriate gauge would have been sufficient for an effective repair.

"Not only did the repairer not use acceptable technical data, I don't think they really appreciated the strength requirements of what they were trying to achieve," says Bob.

CAA's Aviation Examiner of Maintenance Engineering, Rick Ellis, says it would be rare for a regular maintenance provider not to have a copy of AC43.13-1B *Acceptable Methods, Techniques, and Practices – Aircraft Inspection and Repair* in their library.

"There was really no excuse for getting it wrong because in the example, all the acceptable technical data was available to get it right the first time."

Photo courtesy of Howard Chaloner

A Japan Airlines Boeing 747SR-46 taking off from Haneda International Airport in Tokyo.

Bob says, "The trouble is people feel under the hammer to get things done quickly and they take shortcuts.

"But as a very experienced colleague of mine used to say, 'We never have time to do it right, but we always have time to do it twice!'"

Apart from the obvious safety considerations, a botched repair is also a breach of the Civil Aviation Rules.

Included in rule 43.53 *Performance of Maintenance* is the following:

A person performing maintenance on an aircraft or component must use –

» methods, techniques, and practices that are specified in the instructions for continued airworthiness issued for the aircraft or component; or

» equivalent methods, techniques, and practices that are acceptable to the Director.

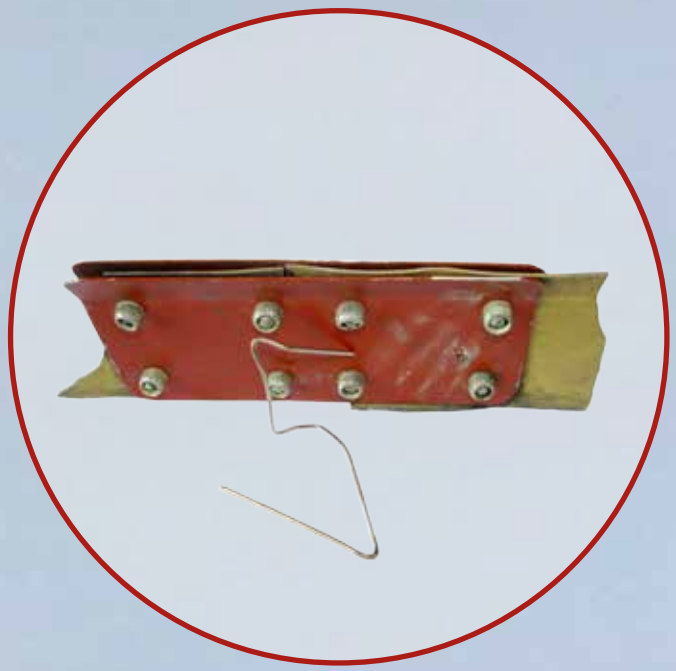
Rick Ellis says that in a situation where there are no specific manufacturers' repair instructions, Part 21, Appendix D, is the correct place to look for information relating to the Certification of Products and Parts.

"It lists specific acceptable technical data and the appropriate conditions to which that data is applicable."

Bob Jelley says a LAME or aircraft tradesman might be a little complacent about Part 21, Appendix D, because they feel like they know it so well they don't even need to look.

"But repairs done in accordance with a good idea and not to acceptable technical data could have potentially dangerous consequences."

Advisory Circular AC43-9 provides further guidance on acceptable technical data and the process for approval of data that is not yet acceptable. ■



It should have been a minor repair using Acceptable Technical Data. But too much material was used and it resulted in the false spar cracking at each end of the pair.

Acceptance of Foreign STCs

Part 21 Appendix D lists Supplemental Type Certificates of several countries as being acceptable technical data, but only if certain conditions that are listed in the Appendix are met.

The most common trap is the condition that states STCs must be supplemental to the Type Certificate (TC) used for Type Acceptance in New Zealand. Countries like the USA and Canada issue their own TCs for imported aircraft, unlike New Zealand, so their STCs are supplemental to their own TCs. This may not be the same TC that has been Type Accepted in New Zealand, as CAA policy is to Type Accept the TC of the State of Design.

So a Canadian STC on a US State-of-Design aircraft may not be acceptable technical data.

Also, at present, there is no blanket approval of EASA STCs.

What to do if you have an STC like that which is not automatically acceptable data? You can apply to the CAA to have the data accepted under the provision of rule 21.503(a). The CAA publishes a list on its web site of data that's been accepted in this manner. Go to www.caa.govt.nz, "Aircraft – Acceptable Technical Data".

Joining **Uncontrolled**

Sound planning, an understanding of local operations, and maintaining the big picture through your scan and radio are essential elements to joining at an uncontrolled aerodrome.

Have you ever found yourself 'flying behind the aircraft' during what should have been a fairly standard approach?

It's an easy trap to fall into when you fail to plan effectively before the flight.

The key to a successful circuit join is situational awareness. And this is built on the foundation of sound pre-flight planning. If you lose situational awareness, remove yourself from the circuit and give yourself time to re-build the picture.

Pre-joining

As always, before you depart, one of your first tasks is to get intimate with the aerodrome charts, namely *AIP New Zealand*, Vol 4, and while you're at it, see if you need approval from the aerodrome operator. The AIP is available, free, online at www.aip.net.nz.

After that, getting a handle on local knowledge is key, says Marc Brogan, CAA Aviation Examiner.

"When you're operating at an uncontrolled aerodrome, regardless of whether it's your home base or not, it's handy to know what takes place there. Sometimes there's a memorandum of understanding that outlines local procedures.

"Obviously, whether you plan on joining straight-in, or overhead, will depend on these factors. Generally, the standard overhead join will provide more time to get a lay of the land, sight traffic, and work out the wind conditions."

Be aware that some aerodromes specifically recommend you don't join overhead due to parachute operations, or other activity at the strip.

Nathan Clarke is the CFI at Canterbury Aero Club and the International Aviation Academy. He is a 4000-hour fixed wing pilot and the Safety Officer at Rangiora Aerodrome. He hasn't had a close call during his 20 years operating out of the strip.

"During your preflight planning/chart briefing, always check the landing chart for additional radio requirements. For instance, Rangiora has an additional final call required.

"Many pilots think Rangiora is just a sleepy little aerodrome that doesn't have much going on, and subsequently, they don't brief properly before flying to the airfield. Whereas, at its busiest, you'll probably be number six lined up ready to go with a possible four or five in the circuit, and several joining.

"Regardless of the aerodrome, always weigh up the risk involved in different approaches.

"When you're joining overhead, you've got more time to build situational awareness, and generally, there's less risk involved.

"Remember that you don't have to come in 500 feet above the circuit if you're worried about what's below you. You can come in 800 feet above (airspace allowing) and then descend.

Photo: istockphoto.com/iStock_Vision

"In my mind, the approach that entails the most risk is joining straight-in on a long final. I don't allow anyone I train to do that. If you choose to join on a long final when you can't see traffic in the circuit, you've already made a commitment to possibly cut someone off.

"Before joining, always have the chart out and do a final check – it's very easy to get the wrong circuit. People get into a mindset that they're going to go for a certain runway, but mistakenly transpose it 180 degrees. Seems hard to do? But we see it regularly – on takeoff too," says Nathan.

Circuit Positioning

Don't let a quiet field lull you into a false sense of security and assume it's safe to join straight-in – there may be NORDO aircraft operating.

"You really need to start thinking about your joining procedure at least 10 miles out from the circuit," says Andy McKay, helicopter pilot and CAA Aviation Examiner.

"If you can't see the runway, you need to be on frequency early to build the picture.

"Count how many different aircraft are in the circuit, and start looking at what is the best way of joining. Don't always expect other pilots to act in a predictable way, or assume those established in the circuit are necessarily going to be operating correctly. It's human nature to mess things up," says Andy.

Carlton Campbell, CAA Aviation Safety Adviser, says pilots need to think outside of the cockpit and visualise the impact of their action, or non-action, on others.

"My biggest tip is to be predictable. State your intentions, then act accordingly, while avoiding 'creative non-standard alternatives'.

"Pilots not operating to standard procedures can cause confusion for other joining aircraft, particularly NORDO aircraft, where the pilot is relying on predicable patterns to safely arrange sequencing.

"Some pilots find it hard enough to integrate with other aircraft of varying performance, especially if those aircraft are acting unpredictably," says Carlton.

The biggest safety risk is on mid-base leg when you're about to turn onto final, says Bill Penman, experienced microlight pilot and retired air traffic controller.

"You have to ensure that you are sequenced correctly, and what's more, that you communicate that sequencing.

"Have a really good look between the threshold, and three or four miles on final, to make sure you're not cutting someone else off. If you're unsure of the traffic sequence, speak up.

"There are a lot of airfields that have parallel operations. Just remember that simultaneous parallel operations are not allowed. So when you're sequencing, be predictable when you're on final. If you're not, it's sometimes quite difficult for the other pilot to determine if you're on approach for the seal or the grass runway."

Roger Ward, another experienced microlight pilot, and air traffic controller, says a standard circuit makes it easier for everyone to maintain visual reference.

"You don't need to be doing a massive two NM-wide downwind ending up on a five mile final. Keep it compact and slow the aircraft down. Just because your aircraft can do 140 knots doesn't mean you have to do it in the circuit. That makes the circuit a lot safer," says Roger.

Helicopters

"Generally speaking, helicopters come in lower and closer than the fixed wing circuit," says Andy McKay.

"The inherent risk for helicopter pilots, is they will generally be operating in the same zone as NORDO traffic.

"From a helicopter pilot's perspective, often we're going to be a lot slower in the approach, so most of the time the biggest threat would be someone else descending onto you," says Andy.

Continued over ⟩⟩

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Simon Spencer-Bower, CEO of Wanaka Helicopters and a 20,000-hour rotary pilot, encourages pilots to make the best use of their helicopters' versatility.

"It's really up to us to keep out of everyone else's way, and compensate for those who don't have the same degree of manoeuvrability or visibility – that's how I teach.

"The most important thing is for pilots to understand where their blind spots make them vulnerable. A fixed-wing pilot can't see down below the nose, and although a helicopter pilot has good visibility out front, they can't see behind.

"At Wanaka, helicopters do circuits at the same height as fixed-wing, whereas some airports have helicopters doing lower circuits. The risk with lower circuits is that you could place yourself in the blind spot of an aeroplane.

"So my tip for fixed-wing pilots is, when letting down on the traffic side of an airfield – which we require at Wanaka due to parachute operations – you shouldn't be letting down on top of the circuit; you should be letting down wide to give everyone a chance to see each other."

Re-circuiting

Changing runways is always a bit of a negotiation. You need to openly communicate your intentions, and get agreement from everyone. Sometimes it can be best to 'plain English it' to avoid confusion.

Roger Ward says that when the wind changes, pilots need to step up and take ownership of the situation.

"During the middle of winter, and at Rangiora in particular, you might start off with a 5 kt westerly because of katabatic drainage down the valley, and then as the day goes on, the wind slowly changes and it turns into an easterly. People just continue to use the original vector.

"After a period of time, someone really needs to step up and say 'hey guys, we've got a tailwind at the moment.' And that's probably the most dangerous time, when all these aeroplanes have to re-position for the other runway. It can get quite messy.

"In my view the best move is to get away from the circuit and re-join for the other runway, rather than doing orbits and 180s downwind. It's easier to spend another 10 minutes, go away and come back," says Roger.

It's always best to try to avoid unnecessary orbits for positioning's sake as they congest the circuit flow. The problem with orbits is that there's a period when the wings are dipped,

and you have a high bank angle. Regardless of whether you're high or low wing, you're going to lose visibility.

But sometimes circuit dimensions are restricted and orbits become necessary. For example, at West Melton on 04, you can't extend downwind due to the firing range.

Flying with the Student Pilot in Mind

Whenever you take any action, consider how a student on first solo would be affected.

"The main thing is to be considerate of others and try to avoid putting pressure on people," says Nathan Clarke.

"It's a bit like opening the door for someone – aviation is no different from being in another public space.

"People tend to assume other pilots have a similar level of experience.

"If there's a new student doing their first overhead join, they're probably going to make a meal of it. So just give them some breathing room, even if you are already established in the circuit and have priority.

"I had a student who was just finishing solo consolidation – four hours' time total – and a transiting helicopter cut below and in front of him while he was on final. Not an ideal situation.

"Speak logically, slowly, and deliberately so they understand your calls, and sequence yourself so you don't put any pressure on them."

Roger Ward says, "If you are doing something unusual in your aeroplane, like a glide approach, or are doing autorotations in your helicopter with a hellishly steep glide angle, you need to let people know. That way, other pilots can adjust their final approach scan accordingly.

"Just make sure you use language other pilots will understand – if a helicopter pilot just says '180 auto', a student pilot may be thinking 'what the hell is that?'"

Situational Awareness

"If you're looking and not seeing, a good instructor will pick that up in an instant," says Nathan Clarke.

"I believe some people fall into a 'happy space' with their lookout, where they are limiting their scan to the direction they are going, just forward of the wings."When flying a high-wing aeroplane, you should probably have a sore neck and back by the end of the day. To do a really good scan, you have to hunch down in the seat and look right back behind the wings to the tail. The work cycle should include a scan right around to the tail on a regular basis.

"Here's a simple test: does your scan pattern change when your radio is turned off? There shouldn't be a difference.

"And while we're on the subject of the radio, always do a radio volume check before taking off.

"Tons of people turn the radio on, and don't check the volume or squelch. Checking these simple things can save a lot of embarrassment, at the very least." Nathan advocates the four Cs – clear, concise, consistent, and correct.

"Keep radio work to the point, and talk slowly. I'm still having trouble, even with instructors, who are talking too fast. The international pilots have a hard time understanding those calls," finishes Nathan.

Bill Penman believes situational awareness is the key.

"Especially if there's a lot of radio traffic. You need to listen to every transmission, and then consider if it's actually relevant.

"When making position reports, there are a lot of people who generally say they're over a particular point, but in reality they're two to three miles from it. So when a pilot starts looking, they look in that general direction, but actually, they need to be looking 30 or 40 degrees either side of it," says Bill.

"Don't get me wrong," says Roger Ward. "I think the radio is a very useful aid, but often there's an over reliance on it, and quite often there's far too much unnecessary chatter.

"And don't assume that all radio reports are accurate.

"I remember joining at Rangiora one day, and I was coming in from the norwest, when I heard an aircraft call and I got sucked in by overusing the information. He said he was five miles west rejoining, 1700 ft. I assumed he was to my right, so I'm looking… I'm looking… I'm looking... and I started to get a little concerned.

"The next minute, I looked down and there was a flash on the left-hand side.

He wasn't West, he was North!" says Roger.

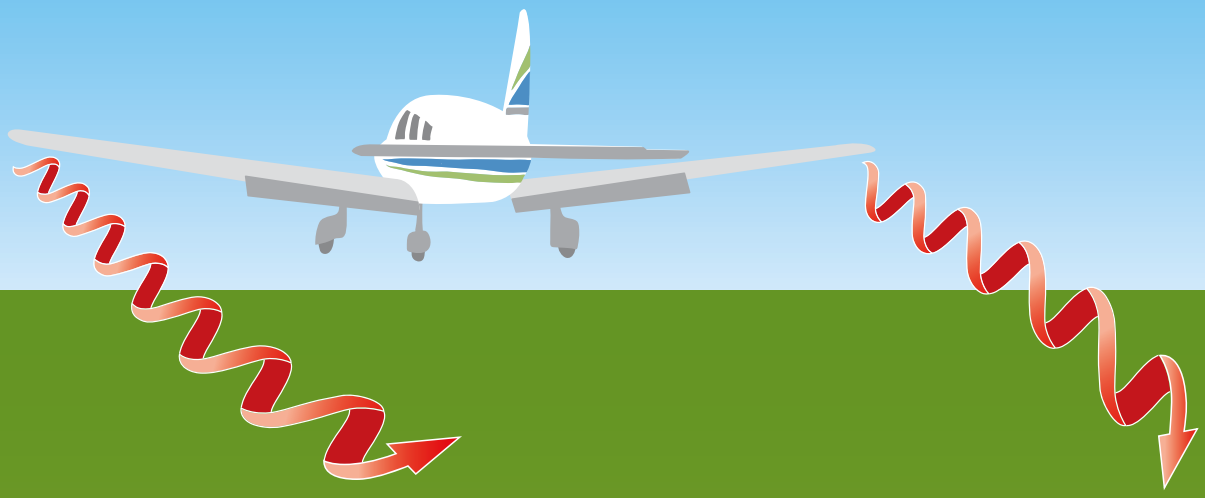
Resources

See the CAA web site for resources to help your situational awareness and radio proficiency, www.caa.govt.nz/avkiwi. ■

If possible, always scan right back behind the wings to the tail.

Wake Turbulence – The Invisible Threat

All aircraft create wake turbulence, and usually the size of the aircraft is a good measure of how much wake it creates. There are some exceptions, however, and we cover this in the newly updated *Wake Turbulence* Good Aviation Practice (GAP) booklet.



You can't see wake turbulence – just its effects sometimes – and that's what makes it so dangerous. Heavy aircraft aren't the only cause. Sure, you know you don't want to be flying a Cessna in the wake path of an A380, but even light aircraft create wake turbulence.

Separation

The key to avoid airborne wake turbulence is sufficient spacing and time between aircraft. In controlled airspace and at controlled aerodromes, Air Traffic Control provides wake turbulence separations and advisory information based on aircraft weight. However, some aircraft require more separation than their weight would indicate, such as the NH90 helicopter used by the Royal New Zealand Air Force.

Wake turbulence incidents can happen with a variety of aircraft, including flying behind aircraft of the same type or weight category.

In general, the risk of unexpected wake turbulence is greatest during an approach in visual conditions at an uncontrolled aerodrome where aircraft are maintaining their own wake turbulence separation.

Factors to take into account include the aircraft weight, weather conditions, and phase of flight.

Helicopters

Wake from helicopters acts a little different from fixed-wing aircraft and is a little harder to predict.

The Air Force's NH90 creates a larger wake than expected for its weight category and should be treated as a large aircraft for separation purposes. The NH90 flies throughout New Zealand but is based at Ohakea, Manawatu.

Neil Jepsen, CFI of the Feilding Flying Club, says despite their proximity to Ohakea, they rarely see the NH90s, but are very much aware of their potential wake turbulence.

"We encourage all our members to be aware of the NH90s and the Air New Zealand and Jetstar turbo props using Palmerston North aerodrome," says Neil.

"We suggest a separation of at least five kilometres, but we generally avoid flying anywhere near the turboprops or the Air Force.

"In saying that, in 50 years of flying, I've never flown into wake turbulence, nor experienced it during takeoff or landing.

"But we still take extreme care to ensure we have plenty of time between aircraft movements during takeoff and landing, especially when there's no wind to dissipate the wake."

GAP Booklet Updated

We've refreshed the *Wake Turbulence* GAP booklet, so now's a good time to refresh your knowledge of this potentially deadly hazard. Order a free copy by emailing info@caa.govt.nz. ■

New Responsibilities **for Worker Safety**

The Health and Safety at Work Act 2015 becomes effective on 4 April 2016. The biggest change is who, or what, is ultimately responsible for worker safety.

"The aviation sector," says Mike Impey, Manager of the CAA's Health and Safety Unit, "is well placed to comply with the new health and safety requirements. That's because those requirements closely match the demands of the Civil Aviation Act 1990."

"It's the same with Safety Management Systems. If the SMS of an organisation is robust, that organisation will meet most of the new health and safety duties.

"For instance, both involve identifying hazards but are risk-based, and can make use of a risk matrix (see page 9).

"A big difference, however, lies in who – according to the new health and safety law – is responsible for what, in terms of worker safety and wellbeing," says Mike.

"There are four duty holder types in each organisation: Person conducting a business or undertaking (PCBU); Officers; Workers; and Others.

"The PCBU can be a physical human being, or it can be a company. 'Person' in this sense is just a legal term. Either way, the PCBU is ultimately responsible for the welfare of everyone affected by the work. They are therefore primarily accountable for anything that goes awry."

The Officers are the most senior members of the organisation such as the directors and CEO. They are to ensure the PCBU is carrying out their duties correctly and fully.

The Workers are obliged to do nothing that will harm anyone else, and so is the final group – Others – who don't work for the company, but visit from time to time, the public or couriers, for instance.

"If we have a lone aviation operator, owning the company, with maybe a handful of staff, they will be the PCBU, and Officer, and of course Worker – multiple roles, multiple obligations," says Mike.

There are added and increased penalties for anyone not carrying out their duty of care properly – up to five years imprisonment and/or a $300,000 fine for an individual; or up to a $3,000,000 fine for a company.

"You can't delegate this duty to an outsider, like you can quality assurance," says Mike. "It's yours, you own it – it's totally your responsibility."

Other changes are:

- PCBUs must engage on health and safety matters with workers who carry out the work or may be affected by the work.
- Suppliers also have duties to ensure that shipments are carried out in a safe manner.
- Safety reps have increased powers – they can issue a 'provisional improvement notice', requiring the company to fix a health and safety concern in the workplace.
- There's a much greater range in what must be reported, including minor occurrences, such as a small oil spill.
- The CAA may investigate events that happen, not just while any aircraft is 'in operation' but also imminently prior to its departure.
- PCBUs of two or more entities working on the same operation have to consult to ensure they jointly manage safety.

"For instance," says Mike, "A farmer is the PCBU of their business, and the manager of an agricultural aviation operation is the PCBU of theirs. They have to get together and discuss how safety will be managed in the air, and on the ground, during the operation."

Go to the WorkSafe web site for guidance on your obligations under the new health and safety law, www.business.govt.nz/worksafe/hswa. ■

Photo: shutterstock.com/gallery-1329970p1.html

Maintenance Controller Course – Is It For Me?

Knowing how to effectively plan maintenance is essential for any air operator or owner, whether you run a large company or own a private plane. The CAA holds courses for people responsible for maintenance control. Have you thought of attending one? Want to know if it's for you? Read on…

Photo: istockphoto.com/andresr

"Many people seem to think that if they're already maintaining the aircraft, they're doing the job of a maintenance controller, however that's not entirely true," says John Keyzer, CAA Aviation Safety Adviser.

"To me it says they don't quite understand the role of the maintenance controller compared with the roles of the engineer or aircraft operator.

"The maintenance controller's role focuses on all required maintenance being done at the correct time, and planning ahead to ensure that it's done correctly," says John.

Canterbury pilot, Simon Bassett-Smith, attended the course recently and says it exceeded his expectations.

"I was expecting a thorough insight into the responsibilities and expectations of a maintenance controller. But my expectations were exceeded.

"It taught me about planning, delegation, and the liability involved – experience that's really going to help with my commercial helicopter business.

"I'd certainly recommend the course, especially to anyone entering into the Part 135 arena," says Simon.

Tauranga-based pilot, Sean Kelly, also attended the course. Sean flies both rotary and fixed-wing craft, and is also a Licensed Aircraft Maintenance Engineer – you could say he's a bit of an all-rounder.

As a relatively new entrant into aviation (he did his first solo flight in 2012), he says he found the course really helpful.

"The course has increased my knowledge of the intricacies of maintaining an aircraft and the rules behind it.

"The highlight, however, was the ability to engage with CAA staff on such a personal level. It really breaks down the barriers between the industry and the regulator."

The course has two parts. The first is a self-paced learning module. It introduces or refreshes your knowledge of the Civil Aviation Rules and how they apply to maintenance. You should allow at least 10 hours for this. It will be mailed out to you at least three weeks before the course.

The second part is a two-day workshop designed to be more hands-on and practical.

"It's a very intense two days," says John. "But it's a very rewarding course. The feedback that we have from participants is always positive."

The Maintenance Controller Course can also be a pathway to the National Certificate in Aeronautical Engineering (Maintenance Control) through the industry training organisation, ServiceIQ. If you register with ServiceIQ for the National Certificate within 90 days of completing the Maintenance Controller Course, you can then receive credits for part of the National Certificate course. See the ServiceIQ web site for more details, including how to complete the certificate, www.serviceiq.org.nz.

Continued over »

Unique Personal Call Signs

If your aircraft has an Approved Identifiable Paint Scheme, you can now apply to have a personal call sign.

Photo courtesy of Mike Wills

Mike Wills, of Havelock North, is the nine-year owner of a Scottish Aviation Bulldog, registration WUF. Having an Approved Identifiable Paint Scheme in the RAF red and white, he wanted a unique personalised call sign, partially to help with the work he does in the Air Training Corps.

A Squadron Leader in the New Zealand Cadet Forces, from time to time he takes cadets up for a flight, to give them experience flying in such an aircraft.

"Being able to have a call sign – Bulldog 57 – just gives it more of a military flavour. It adds to the whole ATC experience," says Mike.

In New Zealand we have a small number of aircraft with a distinctive paint scheme representing historic designs.

These designs can be approved by the CAA to allow the paint scheme to be used as a means of identification, instead of the usual three letter registration.

Even when the three letter registration isn't physically displayed on the aircraft, when making radio calls the Civil Aviation Rules require you to use your aircraft make and registration as a call sign (rule 91.249).

This can make it harder for interested parties to identify your aircraft. Let's say, for example, you're travelling with one or more similar aircraft to an airshow. Three Harvard aircraft, all with similar approved paint schemes, but none displaying their three letter registration. How do you tell them apart?

Driven by the risk of possible misidentification of aircraft in a number of situations, an Exemption (15/EXE/43) has been issued by the Director of Civil Aviation. The Exemption is available on the CAA web site, www.caa.govt.nz, "Rules – Exemptions".

Also on the web site is a list of all aircraft using unique personal call signs. This gives interested parties the ability to look up aircraft using their personal call sign to aid identification.

The Exemption allows certain aircraft with an Approved Identifiable Paint Scheme to apply for a personalised call sign. The call sign will belong to the aircraft and can be used by any pilot flying that aircraft.

But wait… not every aircraft will qualify. There are three strict conditions to meet before you can make use of the Exemption.

In short, the conditions are:

- The aircraft must have a CAA approval for the paint scheme; and
- The call sign must include the aircraft make or model, and any alphanumeric identification displayed on the aircraft; and
- The Director must accept the proposed call sign.

For more information on Identifiable Paint Schemes, see Part 47 and its accompanying Advisory Circular AC47-1.

If you meet the criteria for the Exemption and would like to apply to have your personal call sign accepted by the Director, use CAA form 24047/04, and complete only Section 4, at the bottom. ■

» *Continued from previous page*

2016 Courses

City	Date	Location
Queenstown	11 to 12 May	Copthorne Hotel and Resort, Queenstown Lakefront, 27 Frankton Road
Auckland	29 to 30 June	Jet Park Airport Hotel and Conference Centre, 63 Westney Road, Mangere
Tauranga	24 to 25 August	Oceanside Resort and Twin Towers, 1 Maunganui Road, Mt Maunganui
Wellington	26 to 27 October	Civil Aviation Authority, Level 15 Asteron Centre, 55 Featherston Street, Wellington

Register Online

You can register for a Maintenance Controller Course online, see www.caa.govt.nz, "Seminars and Courses".

We can't guarantee your place on the course until payment is made.

Closing date for enrolment is three weeks before the course. That's because pre-course training notes need to be distributed and study completed before the course. ■

Calling All Part **115 Participants**

Two free CAA-hosted training days in April aim to bring 115-ers up to date on Safety Management Systems, and daily operational challenges. Those in Part 149 and Part 102 are also invited to attend.

Places are limited so book yours now!

Do you want to improve your Part 115 practice and policy?

Do you want to increase your Safety Management Systems (SMS) knowledge?

Then you need to head to Wellington in April!

The CAA will be running a one-day workshop on SMS, followed the next day by a Part 115 Industry Day.

What: SMS interactive workshop – SMS implementation, certification, safety risk management, and safety performance monitoring and management.

Where: CAA, Level 15 Asteron Centre, 55 Featherston Street, Wellington.

When: Wednesday 20 April, 0900 to 1530

Provided: Morning tea and lunch.

To register, email: charlotte.mills@caa.govt.nz

What: Part 115 Industry Day – Covering off amendment process, the importance of reporting occurrences, industry accident rates and trends, introduction to the reporting app *Here & Now*, accidents and their aftermath, post-accident trauma and stress, the legal implications of an accident, the new Health and Safety regime.

Where: CAA, Level 15 Asteron Centre, 55 Featherston Street, Wellington.

When: Thursday 21 April, 0900 to 1500

Provided: Morning tea and lunch.

To register, email: charlotte.mills@caa.govt.nz

Image courtesy of Taupo Tandem Skydiving

The last date for nominations is 23 May 2016

Nominations Open for 2016 Director's Awards and Flight Instructor Award

This year sees the annual Director's Awards coming of age and turning 21. The Director of Civil Aviation is now calling for nominations for this milestone year's Awards, and also the CAA Flight Instructor Award (which started in 2005).

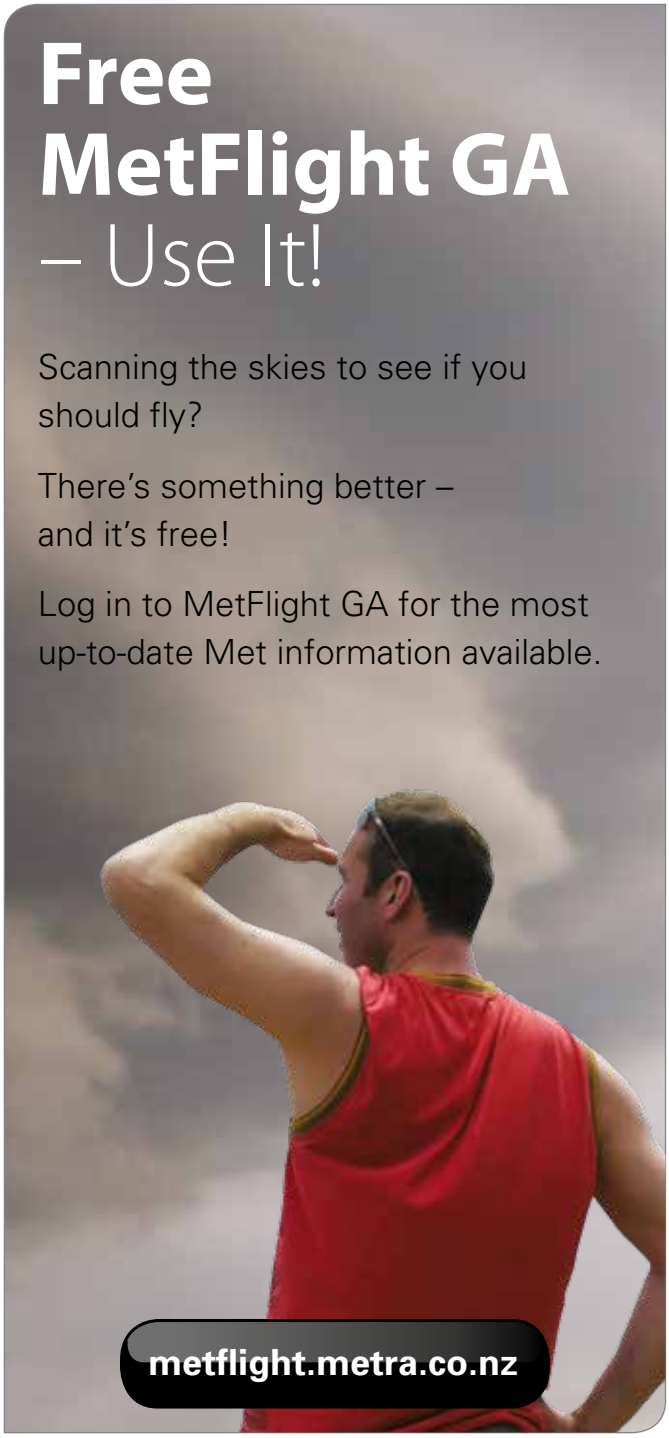
The Awards are presented in three categories: an individual, an organisation, and a flight instructor who really personifies safety.

The Awards give aviation participants an opportunity to acknowledge those who have made a substantial difference to aviation safety. The recipients are recognised for actions that have been responsible for increasing safety awareness and give excellent examples for others to follow.

If you think someone has made this valuable contribution, consider nominating them for these Awards. Send in a few paragraphs on why your nominee should be considered, to the CAA's Manager Safety Promotion, Bill Sommer.

Email: Bill.Sommer@caa.govt.nz
Fax: +64 4 569 2024
Post: PO Box 3555, Wellington 6140

The Awards will be presented to the winners at the annual awards dinner during the Aviation Leadership Summit to be held 26 to 30 June in Wellington. ■



How to Get **Aviation Publications**

AIP New Zealand

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

Pilot and Aircraft Logbooks

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

Rules, Advisory Circulars (ACs), Airworthiness Directives

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

Planning an **Aviation Event?**

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

To allow for processing, the CAA needs to be notified **at least one week before** the GroupEAD (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	GroupEAD (Airways) Cut-off Date	Effective Date
11 Apr 2016	18 Apr 2016	23 Jun 2016
9 May 2016	16 May 2016	21 Jul 2016
6 Jun 2016	13 Jun 2016	18 Aug 2016

Visual Navigation Charts 2016 (scheduled dates for change requests)		
19 Mar 2016	21 Apr 2016	10 Nov 2016

See **www.caa.govt.nz/aip** to view the AIP cut-off dates for 2016.

Aviation **Safety Advisers**

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

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Fax: +64 3 322 6379
Mobile: +64 27 285 2022
Email: Bob.Jelley@caa.govt.nz

Report Safety and Security Concerns

Available office hours (voicemail after hours).

0508 4 SAFETY
(0508 472 338)
isi@caa.govt.nz
For all aviation-related safety and security concerns.

Accident Notification

24-hour 7-day toll-free telephone

0508 ACCIDENT
(0508 222 433)
www.caa.govt.nz/report
The Civil Aviation Act 1990 requires notification "as soon as practicable".

Accident Briefs

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

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

ZK-HYY MD helicopter 500N

Date and Time:	27-Sep-2010 at 15:35
Location:	2 NM north of Mt Ajax
POB:	1
Damage:	Destroyed
Nature of fight:	PRIVATE OTHER
Pilot Licence:	Private Pilot Licence (Helicopter)
Age:	46 yrs
Flying Hours (Total):	652
Flying Hours (on Type):	N/K
Last 90 Days:	N/K

A compressor stall occurred in flight, at approximately 600 feet and half a mile from destination. This was indicated by a loud bang, yaw, and a sudden decrease in altitude. The engine recovered momentarily, but another stall occurred, with accompanying loud bang, yaw, and another sudden drop in altitude. The pilot lowered the collective to enter autorotation and started a left-hand turn into wind.

On ground contact, the helicopter slid and bounced for 45 metres, coming to rest on its right-hand side in a ditch. The pilot closed the fuel shutoff valve, rolled the throttle to ground idle, but in his confusion, instead of closing the throttle to shutoff he reopened it to flight idle. On realising this, he quickly shut the engine off, leaving the master switch on.

A farm worker opened the pilot's door and helped the pilot out. The helicopter had smoke coming from around the rotor head. The fire extinguisher was used but the helicopter was quickly engulfed in flames.

Removal and strip of the fire damaged engine revealed no pre-existing defects that could have contributed to the accident.

CAA Occurrence Ref 10/3727

ZK-BAC BAC BAC-167 Strikemaster Mk88

Date and Time:	15-Oct-2015 at 09:05
Location:	Napier
Damage:	Unknown
Nature of fight:	PRIVATE OTHER
Flying Hours (Total):	625
Flying Hours (on Type):	55
Last 90 Days:	9

The pilot was cleared to join long final and pass behind a much slower aircraft. While searching for the aircraft, and making radio calls to assist locating the other aircraft, the pilot did not fully complete the landing checks. The other aircraft was then told to hold clear, but the pilot did not complete short final checks to confirm the gear was down. It was also noted after the incident that the wheels warning light was not functioning.

CAA Occurrence Ref 15/4926

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".

Cessna 172S

Spark Plug

ATA Chapter:	7420

During the cruise, engine vibrations and an associated power loss, were experienced. The pilot carried out the trouble checks which failed to correct the situation. The pilot cancelled IFR, declared a PAN, squawked 7700 and then diverted to Te Kuiti where the aircraft landed safely.

Maintenance investigation involved ground running the engine, and leaning the mixture, which proved satisfactory. No defects found, suspect fouled spark plug.

During the trouble checks in flight, the pilot turned the electric fuel pump on. On an injected engine as fitted to this aircraft, this generally richens the mixture slightly if the mechanical pump is still operational. It would appear in this occurrence that turning the fuel pump on may have exacerbated the problem by providing an over rich mixture at altitude with a spark plug (or plugs) that were already fouled.

The training provider is to review the procedures carried out by pilots in the event of engine rough running in flight, and ensure that pilots are educated on the actions required in such an event.

CAA Occurrence Ref 15/2774

Piper PA-28R-200

Engine

ATA Chapter:	7200

When the throttle was advanced to gain altitude from the cruise, a load bang was heard and a significant power loss with associated rough running occurred. The pilot was able to return to the aerodrome for a safe landing, the engine stopped during the landing roll out.

Maintenance investigation found that the #3 cylinder lower mounting studs and through bolt had failed. The resulting movement of the now insecure cylinder caused the induction tube for the cylinder to become detached resulting in the partial power loss. It is likely that the rear 1/2 stud failed first followed by the 3/8 studs and 1/2 inch through bolt. As far as could be determined, the rear 1/2 inch stud had failed first due to corrosion. The corrosion created a stress riser and subsequent fatigue failure of the stud. Failure of the studs and through bolts is a known issue, with the FAA publishing Special Airworthiness Information Bulletin (SAIB) NE-14-13 Reciprocating Engine – Cylinder Mounting Studs in March 2014. This SAIB outlines the common known causes of stud failures, which includes corrosion. A link is available on the CAA web site Continuing Airworthiness section for reference to the SAIB. Rather than repair the engine, the aircraft syndicate opted to have a replacement engine fitted to the aircraft.

CAA Occurrence Ref 15/4216

Diamond DA 42

Ball End

Part Number:	BN34-5
ATA Chapter:	2722
TSI Hours:	92.2
TTIS Hours:	972.1

During a 6000 hr inspection, the rudder trim tab lower control rod ball end was found sheared off between the ball end and the threaded portion.

Suspect manufacturing flaw in the metal structure may have led to an early failure. Both ball ends replaced and manufacturer advised.

CAA Occurrence Ref 15/2485

Piper PA-23-250

Cabin Heater

Part Model:	B3040
Part Manufacturer:	Janitrol
Part Number:	45D70-1
ATA Chapter:	2140
TSI Hours:	1
TTIS Hours:	355

Departing Rotorua, a passenger observed light smoke entering the cabin through the heater ducts behind the front seats. The heater was turned off, and the smoke ceased. The aircraft diverted to Tauranga.

The combustion tube was found to be cracked, allowing smoke normally exhausted overboard to enter the cabin heater ducting. An overhauled heater was fitted.

CAA Occurrence Ref 15/3583

Piper PA-31-350

Nil

ATA Chapter:	3200

The pilot advised he had an undercarriage fault indication (the right green and transit lamp did not illuminate), so he discontinued the landing. The flight eventually landed safely after consultation with engineers.

Engineering investigation could not determine the cause. The undercarriage was checked, and found to be latched correctly. The aircraft was jacked up and inspected, and the undercarriage performed properly. It has been recommended that the latch and spring be lubricated weekly with WD40. The problem has not occurred since.

CAA Occurrence Ref 15/4050

AV KIWI SAFETY SEMINARS

What happened here?

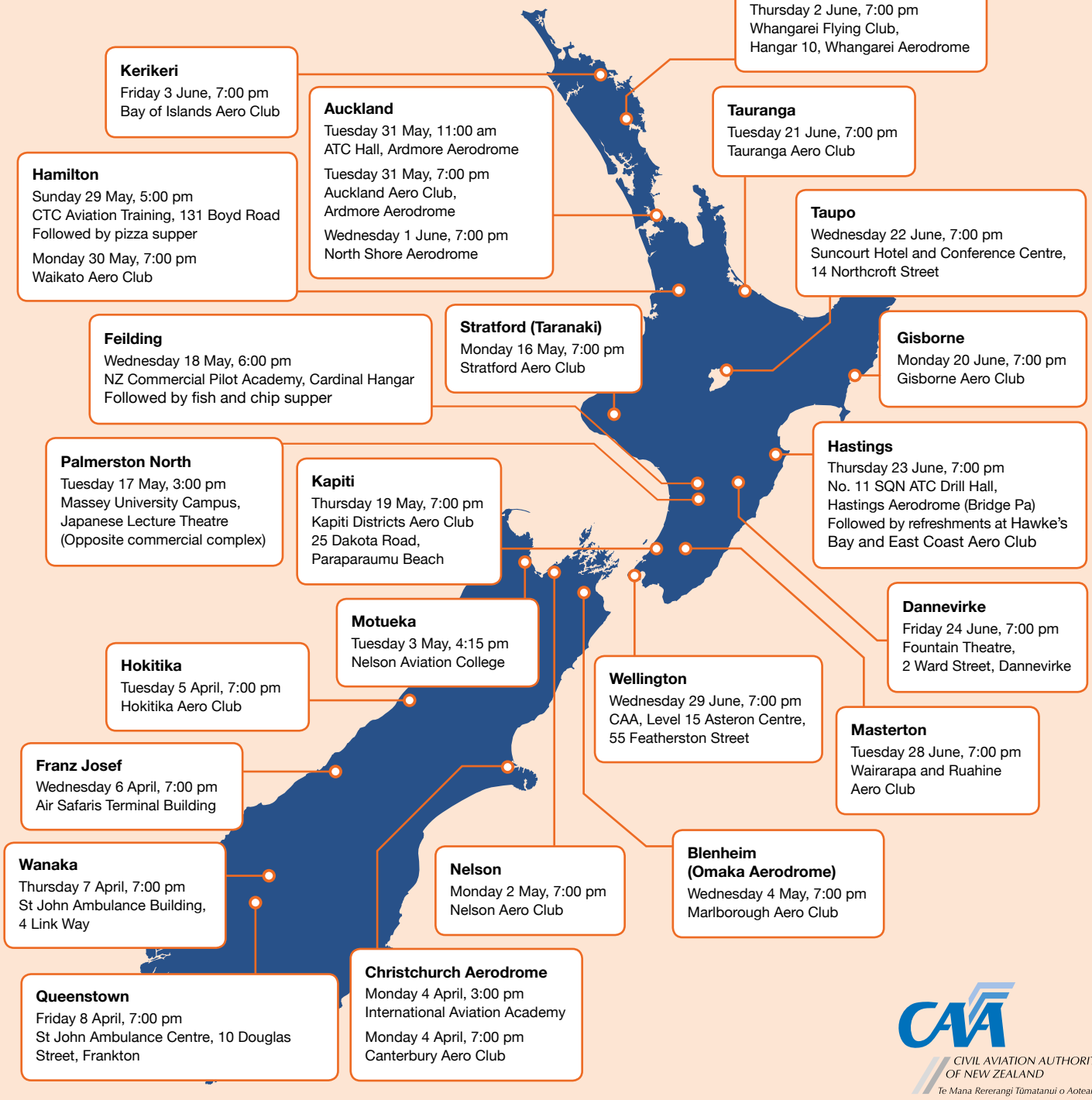
Sifting the lessons from the wreckage

A wise person once said, “mistakes are lessons”. That is never more true than in aviation.

Through accident investigation, the CAA and TAIC sift the causes of aircraft accidents and incidents. There are no new accidents – learn from those who have flown the paths before you.

This year’s AvKiwi Safety Seminar looks at selected accidents and incidents that highlight the importance of having a sound ‘plan B’ and evaluating it; knowing your aircraft; the fatal consequences of commercial pressures; and whatever happens, keep flying the aircraft.

AvKiwi Safety Seminars are free and you don’t need to book. For more information, see www.caa.govt.nz/avkiwi.



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