May / June 2013

POINTING TO SAFER AVIATION

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Winter Happens

SMS Forums

Auckland Airport Changes

Reporting Occurrences

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

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In this issue...

Winter Happens

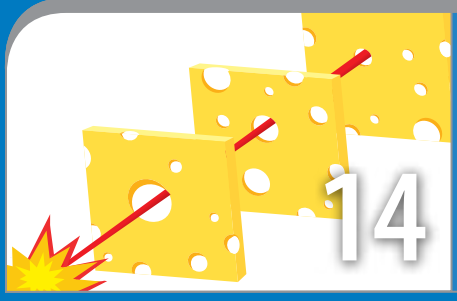
Winter has different meanings for different people, but for the aviation community, it presents a set of known challenges that need to be managed. We discuss several of these and various mitigation measures to help you weather the weather.

SMS Forums

Safety Management Systems (SMS) are the 'new black' in aviation. Join these forums to find out what is happening. You'll hear how you can implement safety systems based on risk awareness and reporting that will improve your operation's efficiency.

Auckland Airport Changes

Runway utilisation will be improved at Auckland International Airport following CAA approval of reduced runway separations, and qualified clearances at night.



Reporting Occurrences

Reporting occurrences is essential to improving safety performance. All the more so, as we move to risk-based safety systems such as SMS. This is a timely review of the basics, and a reminder that you can now report online.

Cover: A tranquil winter setting, but winter isn't always this tranquil, and preparation is the key. See *Winter Happens*, page 4. Photo: ©istockphoto.com/Cody Marsh

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Buying or Selling an Aircraft

If you are thinking of buying or selling an aircraft around the middle of the year, you should be aware that the annual registration fee and participation levy is due on 1 July 2013. The registered owner of the aircraft on that date is the one liable, regardless of the aircraft's state of airworthiness, or any pending sale.

The Civil Aviation Act 1990 defines the "owner" of an aircraft to be the person lawfully entitled to possession of the aircraft for 28 days or longer.

The annual registration fee and participation levy contributes towards the safety services provided by the CAA. Some of these services are: safety investigation and analysis, review and publishing of airworthiness directives, safety promotion such as *Vector* magazine and the CAA web site, and some surveillance activities.

Once issued, the invoice for the registration fee and participation levy is valid and cannot be cancelled or changed to a new owner.

If the registration fee and participation levy is unpaid, the aircraft may be deregistered. Once this happens, any Airworthiness Certificate or Flight Permit is revoked and the aircraft cannot be legally flown.

Who's the Owner on 1 July?

Buyers and sellers may come to an arrangement about the registration fee and participation levy – it's important that they both know what is involved. Both the buyer and seller complete the change of possession form – there is guidance on this on the CAA web site, www.caa.govt.nz, "Aircraft – Change of Possession".

Buyers

If you plan on purchasing an aircraft after 1 July, make sure that the registration fee and participation levy have been paid by the previous owner. If it hasn't been paid, you may not know about this, and the aircraft could be deregistered. If this happens, any Airworthiness Certificate or Flight Permit for that aircraft is revoked.

Sellers

If you are selling before 1 July, and you want the new owner to be liable for the registration fee and participation levy, a change of possession application using Form 24047/03, and the attached fee, must reach the CAA by 1 July. If you are still the registered owner on 1 July, you are liable for the registration fee and participation levy, even though you might sell the aircraft on 2 July.

Considering Deregistering?

If the aircraft is not airworthy, and you choose to deregister it to avoid paying the registration fee and participation levy, ensure that this is done before 1 July, using Form 24047/05.

If it is likely that the aircraft will be flown or be sold within the next few years, it may be more cost effective to keep it registered, especially if it has a non-terminating Airworthiness Certificate or Flight Permit that would be revoked if the aircraft is deregistered.

If you are likely to re-register your aircraft, you can reserve the registration mark for a fee. All aircraft owners and pilots should also read the article "It's More than *Vector*" on page 17. ■

Winter Happens

But it Can be Managed

Winter means different things to different people – some embrace it and can't get enough winter activity; for others, it's a dark, gloomy, unpleasant period to be endured stoically until the days lengthen and summer returns. For the aviation community, it presents a known set of challenges, which will vary with the type and scale of operation. With preparation and planning, however, these challenges can be managed to minimise risk and discomfort.

What Winter Brings

Shorter Days

Daylight hours are in short supply at midwinter, as compared to midsummer – for example, at Christchurch on 21 June, there are just 9 hours 51 minutes of daylight, and on 21 December, 16 hours and 36 minutes. The implications of the shorter days include less flexibility for the day VFR pilot, and generally more night flying for the IFR pilot. Particularly noticeable is the rapid onset of darkness after sunset, and this is exacerbated by overcast conditions – on a bad day it can be quite dark at sunset, making the AIP daylight table times seem a little academic.

Not only is the sun late to rise and early to set in winter, it is lower in the sky throughout the day and thus has the potential to be 'in your face' more of the time. The midwinter sun at Christchurch is only 23 degrees above the horizon at local noon, quite a difference from 70 degrees at midsummer.

Weather

Winter can bring some glorious, crystal-clear, calm weather, in which it is an absolute pleasure to fly. Even when the winter weather is good though, we still pay the price in the form of frosts, ice, and sometimes morning fog.

On the Ground

On an aircraft that has been parked out overnight, frost can be an insidious hazard. It takes only a light frosting on wings or rotor blades to degrade the boundary layer airflow, which is critical to lift development. Frost with the texture of medium-grade sandpaper can be enough to result in a stall after takeoff at what would be normal speed for a clean wing. Similarly, a heavy dew or rain that has subsequently frozen on the aircraft will affect the lifting ability of the wing or rotor, and may add significantly to the aircraft weight if not removed.

A hard frost will turn a normally resilient grass surface into a solid unyielding surface, on which you will feel every tiny bump and corrugation while taxiing. Sometimes it will be difficult to convince yourself that the aeroplane isn't going to shake itself to pieces.

Photo: ©istockphoto.com/skate33

Fog can be a frequent occurrence at some aerodromes, and usually the drive to the field will give you some idea of what to expect. Carry on with flight preparation by all means, but wait until the fog has dissipated and you have good visibility before attempting to take off. Also, it's a good idea to check that your destination isn't similarly affected.

If carrying out night flying training on a cool clear night, keep a weather eye out for fog. Each time round, check the runway lights for a milky halo effect, usually a reliable indicator that fog is forming, and that it's time to call it quits.

In the Air

Lower freezing levels, greater likelihood of encountering icing conditions, rain, and snow can all add to your workload and stress levels. Sometimes there is no choice but to brave the elements if you are operating to a schedule, but generally this will be in a suitably-equipped IFR aircraft. For the VFR pilot, encountering bad winter weather isn't a pleasant experience, and good advice is to turn back early instead of pressing on. Flying in snow conditions especially, not only means reduced visibility and a lower altitude necessary to maintain sight of the ground, but also the risk of encountering whiteout conditions. This could lead to unwitting flight into terrain, or spatial disorientation and subsequent loss of control.

For comprehensive information on operating in icing conditions, see the CAA's *Icing Handbook*.

Being Prepared for Winter

The best defence for your aircraft against winter woes is to keep it in a hangar, but not every owner has that option. For an aircraft that is normally kept outdoors, you might consider using covers, not only for the windshield, but also for the entire airframe. Also, engine intake bungs, pitot head covers and external control locks should be on the list of possibilities.

If the aircraft isn't utilised all that often, it may be necessary to top up the battery charge from time to time, to ensure that it will be ready for that difficult cranking on a cold morning. Depending on location and how cold it gets, you may wish to change your engine oil to a lighter, less viscous grade to reduce starter motor loads. Always refer to manufacturers' recommendations before doing so, however.

Prior cleaning of the windshield and applying rain repellent will not only help immensely when flying in rain, but it will also make it a lot easier to get rid of dew – all you need is a 'slosh' from a water bottle and the dew is gone, as well as being less likely to re-form.

Pre-winter checks should pay particular attention to winter-critical items such as heaters, anti-icing and/or de-icing equipment, interior and exterior lights, and where applicable, the currency and condition of any carbon monoxide (CO) detectors fitted. The CO detector is important because many light aircraft heaters utilise exhaust system heat, and even a small crack or defect in the exhaust system can result in carbon monoxide entering the cabin. A classic case of this is described in CAA fatal accident report 03/1675, on the CAA web site under "Accidents and Incidents".

Personal checks should include appropriate clothing and footwear, especially for doing preflights on cold, wet or icy mornings. In a busy apron environment, high-visibility clothing is essential; preferably types with reflective panels.

Planning Winter Flights

When planning a VFR flight of reasonable length during winter, keep an eye on the developing weather in the days leading up to the flight, so that you have an idea what to expect on the actual day. The weather will affect, among other things, the duration of the flight, the route to fly, and the likely altitude band available to you.

Consider the concept of a 'departure window' – the interval between the earliest available and the latest acceptable departure times. To obtain the latter, calculate the end of daylight at your destination and work backwards by applying the estimated flight duration, including stops, and your personal safety margins. For example, you may wish to arrive one hour before last light so that you will have daylight left for post-flight activity such as securing the aircraft for the

Continued over ❯❯

night. If the weather is less than perfect, it's a good idea to add in extra time to allow for diversions or waiting at intermediate stops for the weather to improve.

Should your 'window' close before you manage to depart, have a Plan B, such as abandoning the attempt until the next day, or terminating the flight at what would otherwise have been an intermediate stop – and for which you will now have a Plan C.

Depending on the route you plan to take, you may need to think about carrying survival gear. At least ensure that everyone on board has warm clothing and sturdy footwear in case of an unplanned landing somewhere remote. Refer to the CAA GAP booklet *Survival* for more detail on equipment and survival in various situations.

Check out the surface conditions of any aerodromes you are likely to use, especially those with a grass surface. These may have become rutted, muddy or waterlogged, all of which will affect landing and takeoff performance. A simple phone call or email to the aerodrome operator should keep you in the picture if NOTAMs are not available for that location.

Before Flight

Preparing for an early start usually means having to do the preflight inspection in the dark. Allow plenty of time, because it's going to take longer than in daylight. A good torch is essential, and supplementing this with a headlamp can be useful as well. It's easy to miss things in the dark, so double check that tiedowns, covers, external control locks, chocks and bungs are removed and stowed.

A very effective preventative action in this case is going home.

If you feel the need to pull the propeller through to make the subsequent start easier on the starter motor, make sure the mags are off, mixture in cut-off, throttle closed and at the very least, the brakes are applied. Always pull the prop in its normal direction of rotation, and treat it as live at all times. If you haven't been trained in how to pull a propeller through safely, don't try it.

If weight considerations permit, fuelling the aircraft to capacity the day before will minimise condensation, which, in an overnight frost, could freeze in drain sumps or filters. If you can't get a fuel sample from a drain point during your preflight, this could be the reason.

Frost or ice on the aircraft must be removed before flight. Water, lots of it, is very effective, but ensure that any runoff isn't going to refreeze and lock up flaps or control surfaces. Chipping or scraping ice has the potential to damage the aircraft paint job, skin, or transparencies. Try to avoid scraping a windshield in particular, as even one decent scratch in the wrong place could render it unserviceable.

Snow piled up on the aircraft means that it's a fairly safe bet that the ground is similarly covered. Snow can hide all manner of hazards: potholes, frozen puddles, runway or taxiway edges and the like. If the runway is snow-covered, your takeoff performance is compromised, as well as directional controllability on the ground. A very effective preventative action in this case is going home.

If it was raining while you were preparing the aircraft, you might be faced with the interior window surfaces misting up as water evaporates from your wet clothing. If the cabin heating or demisting system isn't up to the task, a clean rag or moist chamois cloth should help, but make sure that's all it's ever used for. If a passenger offers to help, check that they don't have on any rings or other bling that could scratch the windows.

Starting a piston engine on a cold morning can present a fire hazard. If possible, post a suitably briefed fire guard with an extinguisher. Excessive priming, be it from an electric boost pump, a manual primer, or the accelerator pump in the carburettor, can result in fuel draining out of either the exhaust or the air inlet and pooling on the ground or inside the engine cowling. A backfire and a lick of flame from the exhaust will ignite the pooled fuel, and in some cases this has resulted in the total destruction of an aircraft.

Once the engine is running, pay close attention to carburettor heat operation during the run-up – you may need it in flight. If flight in any form of visible moisture is anticipated, include switching on the pitot heat in your line-up checks.

Frost or ice on the aircraft must be removed before flight.

After Flight

As indicated earlier, refuelling ready for the next day can reduce the chances of water accumulating in the fuel tanks. Arriving at your destination in daylight gives a good opportunity to perform a thorough after-flight inspection and secure the aircraft if it is to be parked outdoors. Any defects detected in flight should be written up and reported, especially if they involve systems critical to winter flying.

Further Reading

The GAP booklets *Winter Flying, Secure Your Aircraft*, and the *Icing Handbook* all contain useful information on aspects mentioned in this article, and are all available on the CAA web site, www.caa.govt.nz. Hard copies of the GAP booklets are available free of charge on request from info@caa.govt.nz, and the *Icing Handbook* at cost from Vertia (formerly The Colour Guy), on 0800 GET RULES, or via their web site, www.vertia.co.nz. ■

Spectacular frost patterns on a PA-38 Tomahawk wing

Photos courtesy of Paul Neame.

Options for Future Aviation Regulation

Our aviation system is one of the safest in the world. Unfortunately, accidents and serious incidents continue to occur and may even increase with changes in aviation such as growth and technology. Our current system has served us well, but the challenge now is to find ways to proactively manage risks to maintain and improve our excellent safety record.

Photo: ©istockphoto.com/Sebastian Kaulitzki

The CAA wants to hear your views on the future options for regulating aviation safety.

Options include:

- Continuation of the status quo;
- Increased inspections, audits and enforcement;
- Voluntary implementation of risk management systems;
- Mandatory implementation of risk management systems.

The CAA recommends the approach of mandating implementation of a risk management system, such as a Safety Management System (SMS). This would have the greatest effect on increasing safety, with associated business benefits.

The consultation document is on the CAA web site, www.caa.govt.nz, "Safety Management Systems (SMS)". Also, for more information, you could attend one of our SMS Forums (see next page). We welcome your comments on the proposals by **8 July 2013**.
Email: consultation@caa.govt.nz, or post:

Bryce Wigodsky, Policy Adviser
Civil Aviation Authority
PO Box 3555
Wellington 6140

Risk Management and SMS

A Safety Management System (SMS) is an example of risk management in practice. SMS is an organisational risk management framework where businesses have formal systems for hazard identification, risk management, safety targets, investigations, and safety education. SMS can be scaled to best suit the size and complexity of the organisation.

SMS is the international safety standard prescribed by the International Civil Aviation Organisation (ICAO) and has been implemented by the majority of contracting States. New Zealand's adoption of SMS would align with international best practice and facilitate access to overseas markets.

Making the change to this new approach will bring some initial costs to both participants and the CAA. In some countries that have implemented mandatory risk management systems, the benefits have been reduced compliance costs and fewer accidents.

Many aviation businesses have already implemented SMS to improve their safety, efficiency and profitability.

SMS, or a similar plan, would become part of the CAA's certification process, auditing, and surveillance under the proposals. Operators with a high-performing SMS may not need to be audited as frequently, reducing their regulatory compliance costs.

Non-commercial organisations would not need to establish an SMS, but the CAA would still adopt a risk management approach to safety regulation for them.

To soften the impact of the transition to risk management regulation, any changes would be made in two stages. All commercial operators would have a transition period to establish an SMS after the implementation date of their rule group. New entrants would be required to have an SMS as part of their initial application.

Advisory Circular AC00-4 provides guidance on developing and implementing an SMS. ■

Get the Mental Picture

If I can't picture it, I can't understand it. – Einstein

- **Have you ever come way too close for comfort to another aircraft?**
- **Have you ever landed after a flight and wondered, "How on earth did I get myself into that?"**
- **Have you ever lost track of what's going on around you, especially in busy airspace?**
- **Have you ever relied on luck to keep you safe?**

This year, the AvKiwi Safety Seminar is looking at collision avoidance, with specific emphasis on situational awareness – building and maintaining that all important mental picture of what's going on around you – because it's this incredibly important set of skills that will keep you out of the statistics.

But wait, there's more! Not only will you gain amazing insight into how situational awareness can save your life, you will also come away with some skills to improve your situational awareness, and (as if that's not already enough) a CD-ROM to teach you even more about situational awareness, including some games to practise those skills on.

But wait, there's even more – for those of you with smartphones, and other such devices, we will be launching a situational awareness app, to help you continuously improve your situational awareness skills.

AvKiwi seminars are FREE to attend. This is the final week of seminars for 2013. ■

Gisborne	Monday 10 June, 7:00 pm Gisborne Aero Club
Hastings	Thursday 13 June, 7:00 pm Aerial Mapping Hangar, Hastings Aerodrome (Bridge Pa) Followed by refreshments at Hawke's Bay and East Coast Aero Club
Masterton	Friday 14 June, 7:00 pm ATC Building, Masterton Aerodrome (Hood)
Taupo	Wednesday 12 June, 7:00 pm Suncourt Hotel and Conference Centre, 14 Northcroft Street
Tauranga	Tuesday 11 June, 7:00 pm Tauranga Aero Club

AV KIWI SAFETY SEMINARS

Forums

The CAA is holding forums on Safety Management Systems (SMS) from 10 to 13 June 2013 in Auckland, Palmerston North, Christchurch, and Queenstown. They will be an opportunity for you to find out about safety management changes already happening in the aviation industry and the CAA.

Topics to be covered include the benefits of an SMS, guidance on implementation, and options that include rule proposals. Senior CAA staff will be there to answer your questions.

All participants will receive some guidance material, including booklets providing practical advice and tips on SMS.

The forums will be held in four different locations around the country, selected to make it easy for you to attend. It's free, and lunch is provided. Places are limited though, so you will need to register, giving your name, organisation, and contact details.

Email: sms@caa.govt.nz, or call 04 560 9400.

Auckland	11 June 2013
Christchurch	12 June 2013
Palmerston North	10 June 2013
Queenstown	13 June 2013

All the forums are 9:30 am to 3:30 pm. For more information, including venues, see the CAA web site, www.caa.govt.nz, "Safety Management Systems (SMS)". ■

Ageing Cessnas

The clock's ticking for *all* Cessna 100 and 200 series operators. 'Legacy' 200-series operators have until December 2013, while 'Legacy' 100-series operators have until June 2014 to get their aircraft compliant with the manufacturer's Supplementary Inspection Documents (SIDs) programme.

There are currently 646 Cessna 100s and 73 Cessna 200s on the New Zealand Register.

CAA Team Leader Airworthiness, John Bushell, says, "The SIDs programme is part of the aircraft maintenance programme, and come the due date, all 'Legacy' aircraft operators will have had two years to get this ageing aircraft programme completed.

"Most of these aircraft are operating well beyond their original design life, and this is why Cessna published the SIDs inspection requirements. Regardless of Part 91, Subpart G *Operator Maintenance Requirements*, all manufacturers' ageing aircraft requirements must be complied with.

"Operators should talk to their maintenance provider as soon as possible to book their aircraft in to complete the inspection. If operators wait until the last minute, maintainers are not going to be able to complete the SIDs programme before the cut-off deadline," warns John.

Cessna 're-start' Aircraft

Some 're-start' (post-1986) aircraft operators think that the SIDs inspection requirements may not apply to their aircraft.

However, Cessna included SIDs for the 're-start' 100 and 200 series after the initial SIDs launch for pre-1986 aircraft. The SIDs are an integral part of the 're-start' aircraft maintenance manuals, and all 're-start' aircraft should be compliant with the SIDs inspection requirements specific to their aircraft by the due date of 31 August 2014.

Not Just Cessnas

Any aircraft that is not compliant with the manufacturer's ageing aircraft programme must not be flown after the cut-off deadline.

"Ageing aircraft programmes are applicable to all aircraft, **irrespective** of manufacturer. So, for example, even if you operate a Piper or a Beechcraft, the ageing aircraft programme specific to that aircraft should be completed by the due date, as per the manufacturer's instructions. There will not be any extension of the time limit," clarifies John.

More Information

- The CAA has issued a Continuing Airworthiness Notice. View it on the CAA web site, www.caa.govt.nz, under "Airworthiness Directives – Continuing Airworthiness Notices – 05-003"
- Contact your maintainer.
- View your aircraft manufacturer's web site.
- Refer previous *Vector* articles: *Revision to Cessna Service Manuals*, March/April 2012.

  Ageing Aircraft, July/August 2012.
- Email CAA's Team Leader Airworthiness, John Bushell, john.bushell@caa.govt.nz. ■

A selection of images of structural damage in Cessnas, that were all discovered during SIDs inspections.

Auckland Airport Changes

By Paul Robinson, Airways Operations Planning Specialist, Auckland Tower

CAA approval for two new reduced runway separations and the use of qualified clearances at night, and vacating the runway via recommended exit taxiways will assist the runway utilisation rate.

Auckland is New Zealand's largest and busiest regular public transport airport. Over time, there has been a steady increase in the number of aircraft wishing to use Auckland's single runway. Currently Auckland has an average of 460 movements per day, of which more than 90 per cent are aircraft of maximum certificated takeoff weight (MCTOW) of 7000 kg or greater. With the projected increase in movements and the desire to manage peak-time capacity more effectively, there is a need to improve the efficient use of the existing 3535-metre runway.

To meet service level expectations from the airline operators and Auckland International Airport Limited (AIAL), the air navigation services provider, Airways New Zealand, must continually strive to increase runway utilisation while maintaining the target level of safety. A basic requirement of aerodrome control is that only one aircraft at a time occupies the runway during landing or takeoff, with the separation distance fundamentally being the length of the runway. The longer the runway, the greater the distance required between aircraft. However, there are circumstances where this can be modified, resulting in an increase in runway utilisation.

The principal methods for achieving an increase in runway utilisation are:

1. the use of qualified clearances; and
2. the use of reduced runway separation standards.

At present, controllers in New Zealand can use qualified clearances and reduced runway separations only in daylight.

The CAA has approved the use of some new procedures at Auckland Airport.

Reduced Runway Separations

The use of two reduced runway separations has been approved. One of them is an ICAO separation, and the other is used by air traffic services at busy scheduled services airports in the UK. They are as follows:

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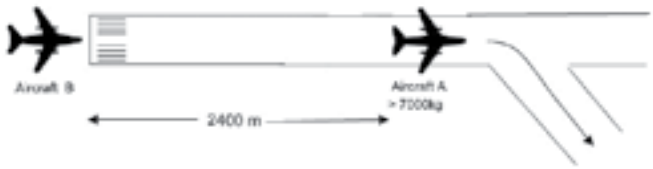
Auckland International Airport.
Photo courtesy of Airways.

Landing Following Landing (ICAO)

A succeeding landing aircraft may cross the runway threshold when a preceding aircraft (greater than 7000 kg) has landed and passed a point at least 2400 metres from the threshold of the runway, is in motion and will vacate the runway without backtracking.



Landing Following Departing (UK air traffic service)

A landing aircraft may cross the runway threshold when a preceding departing aircraft will be airborne and at least 2000 metres from the threshold of the runway, or if not yet airborne, is accelerating and at least 2400 metres from the threshold of the runway.

In addition to the normal criteria that apply to existing reduced runway separations (daylight only, minimum visibility of 5 km, etc), these new separations can be applied only if any tailwind does not exceed 5 knots, and if the full runway length is available.

This will not mimic North American practices where aircraft are cleared to land number 3 or 4, etc, behind others ahead on final. Auckland controllers will continue to manage their traffic in the conventional manner, except that for these situations the distance between aircraft is potentially slightly less.

Two issues are important:

1. Pilots can expect that there may still be an aircraft on the runway when they receive a landing clearance on short final; and
2. The provisions regarding standard wake turbulence separations and protecting the missed approach override the application of reduced runway separations.

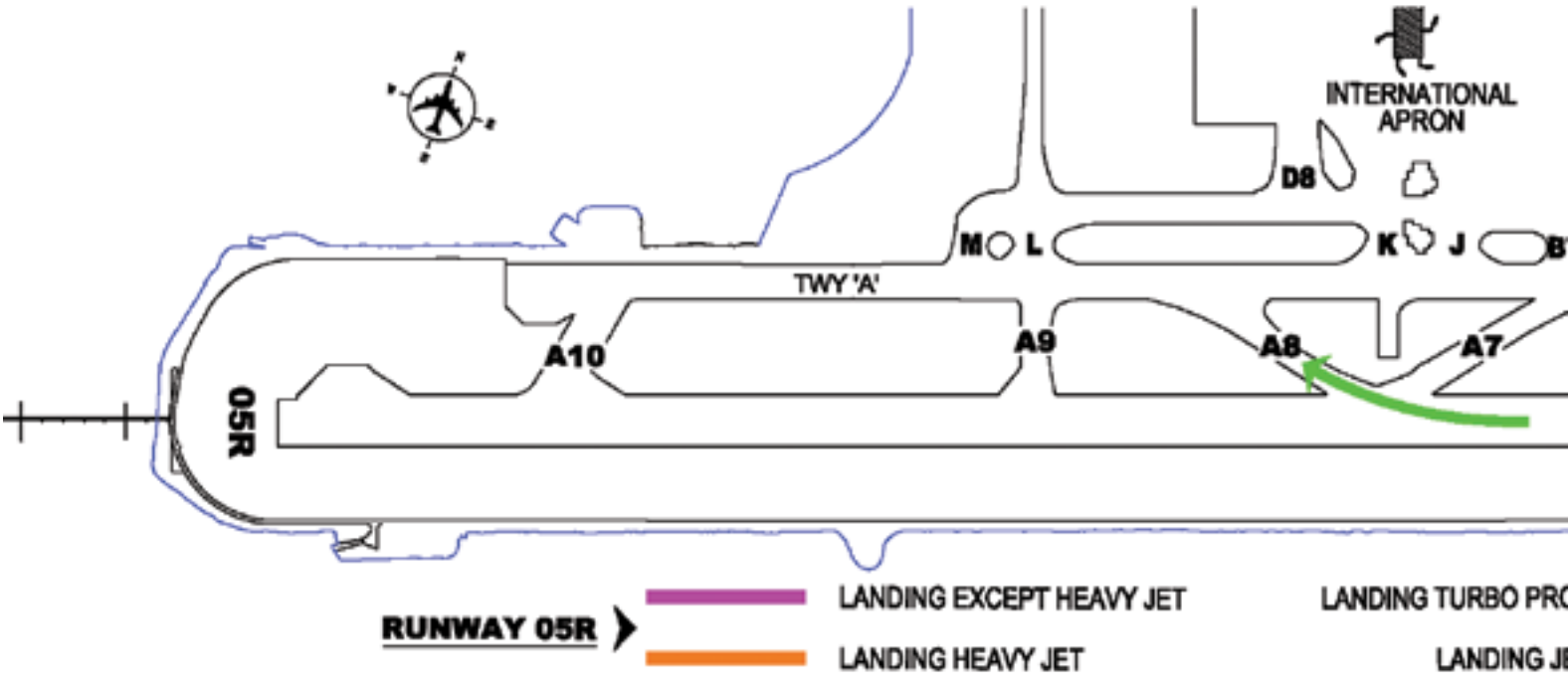
Qualified Clearances at Night

Controllers use qualified clearances to land or take off if they have reasonable assurance that the required separation will exist when the arriving aircraft crosses the threshold or the departing aircraft commences takeoff. A qualified clearance does not reduce the runway separation being applied. A qualified clearance is used to facilitate early decision-making for the controller and pilot, thereby diminishing uncertainty for both participants.

Qualified clearances can be used only when certain criteria are met. In essence they are similar to, but not exactly the same as, the criteria for reduced runway separations. The CAA has approved the extension of their use through the night at Auckland, even though they can be used only during daylight at other controlled airports in New Zealand. This decision is based on the combination of a longer runway at Auckland plus the greater certainty of aircraft position provided by the surface surveillance system in use there.

If the surface surveillance system is not operative, Auckland controllers will not use qualified clearances at night.

Rapid Exit Taxiways



Runway Occupancy Time

Auckland Tower, in conjunction with AIAL, Air New Zealand, and Jetstar, has implemented some new procedures as part of a larger airport capacity enhancement programme to provide greater certainty with runway operations and remove taxi conflictions between arriving and departing aircraft.

Arriving Aircraft

A rapid exit from the runway enables controllers to apply minimum spacing on final approach that achieves maximum runway utilisation and minimises the occurrence of go-arounds and missed departure gaps. In order to ensure a minimum runway occupancy time, whenever operational conditions permit, pilots are expected to vacate the runway after landing, via the following rapid exit taxiways (RETs):

Landing RWY 23L	**Turbo-prop aircraft**	TWY A6 – 1430 m LDA
	Jet aircraft	TWY A8 – 2035 m LDA
Landing RWY 05R	**All aircraft except heavy jet**	TWY A5 – 1710 m LDA
	Heavy jet aircraft	TWY A3 – 2315 m LDA

It is recommended that pilots plan their exit from the runway, and if unable to meet the assigned RET, advise ATC of their intended exit taxiway when on final approach. If after landing you think you will miss your target runway exit point, roll ahead to the next exit **at speed**. The RETs at Auckland have a radius of turn-off curve better than the minimum specified by ICAO to vacate the runway at exit speeds of up to 50 kt in wet conditions.

Obtain your taxi clearance from GROUND on 121.9 MHz when clear of the runway.

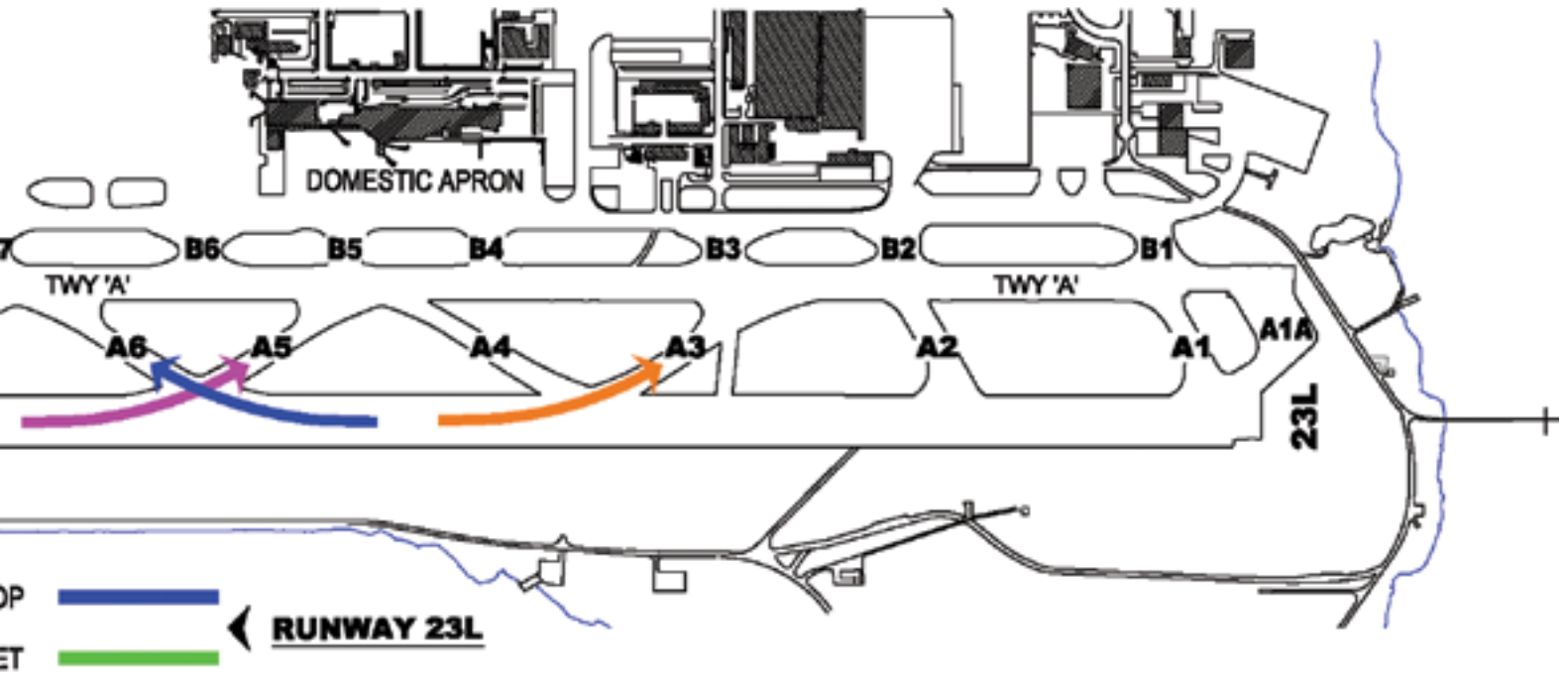
Departing Aircraft

Outbound taxi routes will generally be allocated by controllers in an effort to achieve a circular flow of taxiing aircraft where possible. Pilots should arrange their taxi to be ready to depart without delay on reaching the specified runway holding point. They should advise GROUND before entering the departure taxiway if extra time is needed to ready their aircraft for takeoff – ATC may decide to change their holding point.

Pilots should taxi onto the runway without delay, and react promptly to the takeoff clearance. Unless given an instruction to line up and wait, they should be prepared to depart without stopping. Standard ICAO wake turbulence separation is applied. If pilots require more separation than the standard, they should advise ATC **before** they line up on the runway.

Controllers expect pilots to commence roll **without delay** when cleared for immediate takeoff. Reasons for an immediate takeoff instruction may not be readily apparent to the cockpit crew, but controllers will not issue the instruction without cause.

Remember – a controller's level of confidence in the pilot's ability to get on and off the runway expeditiously is a key factor in runway utilisation decisions. A high degree of confidence will result in improved efficiency to the benefit of all user airlines. ■



Reporting Occurrences

Our safety system relies on the reporting and investigation of occurrences to find out what caused them. That information enables us to put measures in place to prevent accidents.

Now there's a shift to look more closely at the risks in our aviation activities, as Mark Hughes, CAA General Manager Operations and Airworthiness, explains.

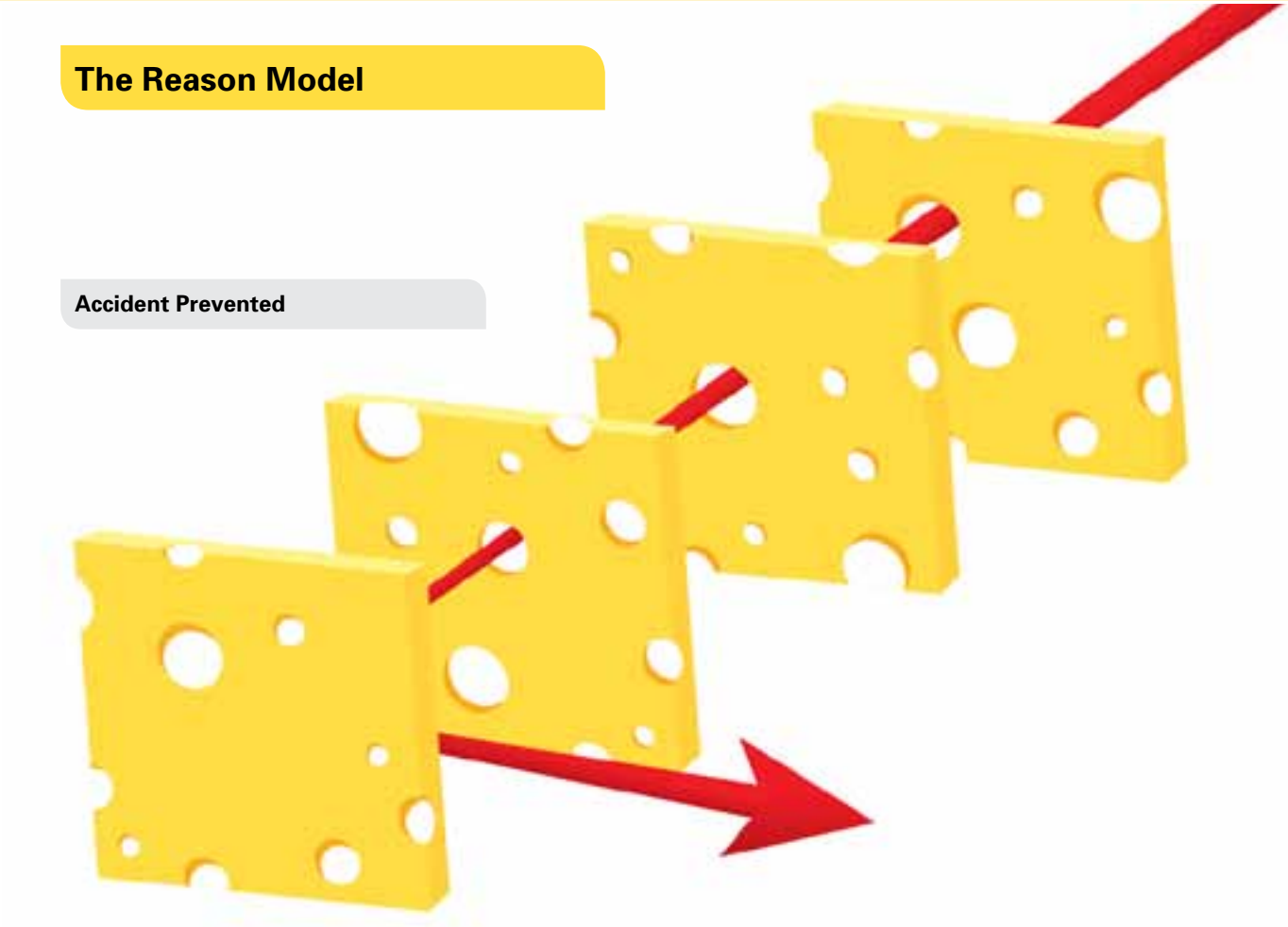
"Safety has been traditionally viewed as an *absence of harm* and measured by accident statistics. Now, safety is considered as an *acceptable level of risk*. This change is quite empowering and requires those involved in aviation to assess and manage risk to prevent accidents, and avoid the human and economic consequences of such events. This innovation in aviation safety thinking is best exemplified by the Safety Management System (SMS) approach.

"Risk assessment requires an active reporting culture within an aviation organisation. A blame-free reporting environment, called a 'just culture', is necessary to encourage occurrence reporting.

"The promotion and practice of risk reduction must be supported by all participants," says Mark.

The Reason Model

The Reason Model (often referred to as the 'Swiss Cheese' model), developed by Professor James Reason, illustrates how an accident can have many contributing causes, but also that a single defence that we put in place can prevent the accident occurring. The slices of cheese represent various factors that make up your aviation operation. They're



not static, but changing and moving to represent activity. But there are holes, and when they line up, there are enough causal factors for an accident to happen. The holes are the risks in an aviation operation. We need to assess those risks, and build up defences, figuratively plugging the holes in the cheese, so that accidents are prevented.

Incidents are Important

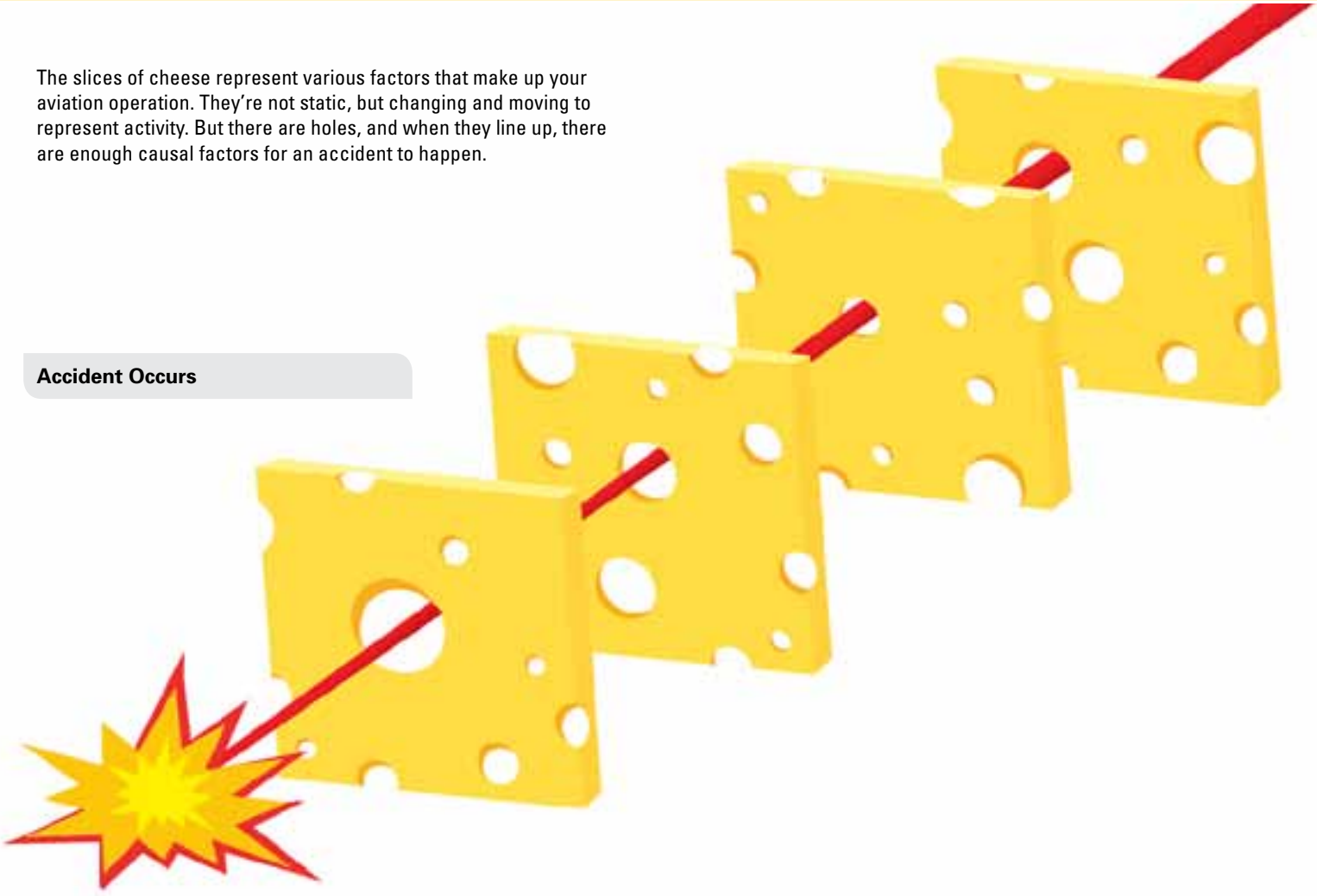
For a number of reasons, many occurrences are not reported. It's important to realise that the data accumulated from many incidents helps to form the bigger picture, as this example shows:

> During a pre-flight inspection, the pilot of a light aircraft felt a restriction in the aileron control system. After a thorough engineering examination, an aileron control cable was found to have failed.
>
> The aircraft operator and the pilot-in-command promptly reported the occurrence.
>
> When the CAA investigated, the failure of the cables on this type of aircraft was found to be well known among other operators. The cables often exhibited areas of wear and were replaced at inspection time or at a self-imposed flight time limitation, often without being reported as a defect. Due to poor reporting, the numbers of these occurrences did not seem serious.
>
> Thanks to the few operators that reported, concerns were then raised regarding the cable failure rate of this type in the New Zealand fleet. The aircraft manufacturer and a number of operators, assisted by the CAA, then developed a modification to prevent the wear and possible failure of the cables.

Further illustration of the importance of incident reporting comes from a study of industrial accident data that showed for each fatal, serious, or disabling accident, there were 10 serious incidents, and 360 minor incidents (as shown in the illustration, on page 16). If we can analyse the many incidents, we may be able to put defences in place that will

Continued over »

The slices of cheese represent various factors that make up your aviation operation. They're not static, but changing and moving to represent activity. But there are holes, and when they line up, there are enough causal factors for an accident to happen.



prevent a serious accident.

If you are unsure whether an occurrence should be reported, then it probably should be! And it's so easy to report with our online form.

How to Report

There are two steps: the initial notification, and the follow-up when you provide details.

For the initial notification, call 0508 ACCIDENT (0508 222 433).

The initial notification is required "as soon as practicable". This means the first phone you come to. It does not mean within one day, nor when convenient. It means as soon as you can, and if you have a serviceable mobile phone, you can do it straight away (once any danger to life or property is taken care of).

Within 10 days (14 for an incident) you must report the details. This is easy – you can do it online:

www.caa.govt.nz/report

You will receive an email of your report, asking you to confirm or amend the details.

There are also forms on the web site that you can email or fax into the CAA.

There are a few things you need to be familiar with. It's really important that you read Part 12 *Accidents, Incidents, and Statistics* – it's not a large document. The definitions of an accident and incident are in the Civil Aviation Act 1990 – you need to know these to know when it's compulsory to report. And you'll find the guidance in AC12-1 helpful, especially Appendix A, the examples of incidents that need to be reported.

Sport and Recreation

Adventure aviation activities under Part 115 are within the Part 12 reporting umbrella, and sport and recreation operations must report accidents under Part 12, but there is a difference when it comes to incidents. Notification and reporting is not required for incidents associated with operations conducted under Parts 101, 103, 104, 105, and 106 (Rule 12.1(b)). These include parachute, hang glider, glider, and microlight operations. We still need to learn safety lessons though, so participants are encouraged to report incidents to their respective Part 149 organisations.

Accident/Incident Pyramid

A study of industrial accident data showed that for each fatal, serious, or disabling accident, there were 10 serious incidents, and 360 minor incidents. If we can analyse the many incidents, we may be able to put defences in place that will prevent a serious accident.

Photo: ©istockphoto.com/fatido

Definitions

Occurrence is a generic term for an accident or incident, both of which are defined in the Civil Aviation Act 1990 as follows:

Accident means an occurrence that is associated with the operation of an aircraft and takes place between the time any person boards the aircraft with the intention of flight and such time as all such persons have disembarked and the engine or any propellers or rotors come to rest, being an occurrence in which:

(1) a person is fatally or seriously injured as a result of:

(i) being in the aircraft; or

(ii) direct contact with any part of the aircraft, including any part that has become detached from the aircraft; or

(iii) direct exposure to jet blast –

(iv) except when the injuries are self-inflicted or inflicted by other persons, or when the injuries are to stowaways hiding outside the areas normally available to passengers and crew; or

(2) the aircraft sustains damage or structural failure that:

(i) adversely affects the structural strength, performance, or flight characteristics of the aircraft; and

(ii) would normally require major repair or replacement of the affected component –

(iii) except engine failure or damage that is limited to the engine, its cowlings, or accessories or damage limited to propellers, wing tips, antennas, tyres, brakes, fairings, small dents, or puncture holes in the aircraft skin; or

(3) the aircraft is missing or is completely inaccessible.

Incident means any occurrence, other than an accident, that is associated with the operation of an aircraft and affects or could affect the safety of operation.

Part 12 further categorises incident types as Aircraft, Aerodrome, Airspace, Bird, Cargo security, Dangerous goods, Defect, Facility malfunction, Promulgated information, and Serious. ■

It's More than **Vector**

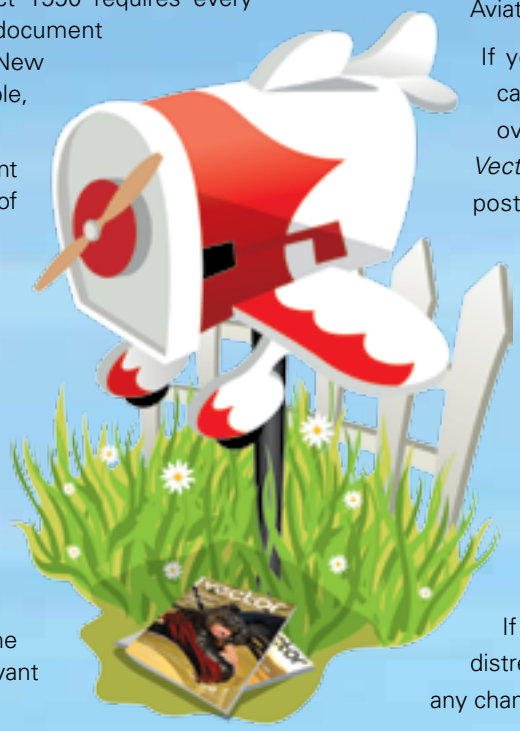
Thanks for letting us know your new address – we get a flurry of messages after every *Vector* mailing. But the wording of the emails clearly shows that many do not understand the legal obligations of holding a New Zealand aviation document.

Section 8 (2) of the Civil Aviation Act 1990 requires every applicant for a New Zealand aviation document to supply an "address for service" in New Zealand including, where applicable, telephone and facsimile numbers.

The Act also requires aviation document holders to notify the Director **promptly** of any changes to the address for service, telephone number or facsimile number.

You can do this by emailing info@caa.govt.nz.

An "address for service" is a physical address. You can have mail sent to a different address if you like, but maintaining a current physical address for service with the CAA is a legal requirement under the Act. This applies to both individuals and organisations, whether based in New Zealand or overseas. The requirement is specified on relevant application forms.



If you live overseas, or plan to relocate overseas, you must nominate a physical address in New Zealand. This could be the address of a lawyer, a family member, or an aviation organisation. In doing so, you accept that delivery to that address is formal notification for the purposes of the Civil Aviation Act 1990.

If you use a separate postal address, that can be a New Zealand address or an overseas address, but be aware that *Vector* magazine is sent only to New Zealand postal addresses.

Applicants under the Trans Tasman Mutual Recognition Act also need to comply with the Civil Aviation Act 1990, and the relevant forms (24061/09 and 24061/10) reflect this.

You also need to advise other organisations that you do business with, of your change of address. If you subscribe to *AIP New Zealand*, for example, you need to contact Airways. If you operate an aircraft with a 406 MHz distress beacon, you must notify RCCNZ of any changes to your contact details. ■

Partial Power

Many occurrences result in fatalities or serious injury due to pilots losing control of their aircraft after an engine partial power loss, especially in the takeoff phase of flight.

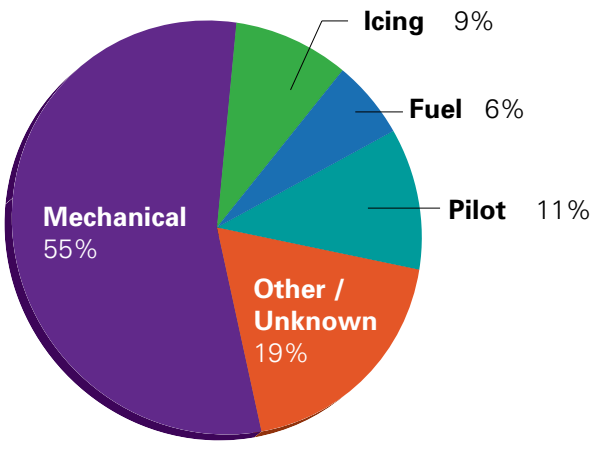
A partial power loss is where the engine is providing less power than that commanded by the pilot, but more power than idle thrust. This presents a more complex scenario to the pilot than a complete engine power loss.

With a partial power loss, there are strong influences working against you, simply because the engine is still providing some power, but this power may be unreliable. For example, in the takeoff phase, this may lead to a strong desire to return the aircraft to the runway rather than land ahead.

From 1 January 1995 to 31 December 2012, there were 59 occurrences of engine power loss, with 3 fatalities and 12 serious injuries recorded, that were reported to the Civil Aviation Authority. A further 71 persons sustained minor or no injuries.

As occurrences of partial power loss occur three times more often than a total power loss, your preflight planning should consider a partial power loss event as much as a total power loss.

With over 30 per cent of recorded partial power loss incidents happening during the takeoff and climb phases, let's look at options you can use to prepare for a possible power reduction.



Graph of reported causes of engine partial power loss

Preflight Planning

By considering the many factors involved in the takeoff, such as wind strength and direction, runway direction, terrain and obstacles, and landing options on and off the airfield, you will reduce the mental workload required to handle a loss of power. This can also help you with decision making under stress or a high workload in an emergency.

Getting this plan together before you leave, will give you the confidence to carry out timely and positive actions if required.

Preflight Checks and Inspection

The preflight inspection is a vital action for any flight and can reduce the likelihood of a partial power loss occurring after takeoff. See *Vector*, "Before You Go", March/April 2013.

Ensure the engine starts easily and runs smoothly, and allow an adequate warm-up time.

Conducting a thorough engine run-up is an important step. Testing fuel flow from the selected tank (fullest or takeoff tank), checking for correct operation of the carburettor heat control, and checking and comparing individual magnetos for a specified RPM drop range is vital. Engine oil temperature and pressures, fuel pressure, and other engine or systems gauge indications should be within accepted aircraft operating limitations.

Allow plenty of time to conduct the engine run-up check to help show any abnormalities with both the engine and fuel


Photo: ©istockphoto.com/Damian Gil

system, and never attempt to take off when the engine continues to misfire or is running rough.

Fuel

Fuel starvation, exhaustion, or contamination, also rate highly as causes of partial power often leading to total power loss. The following checks may help prevent this happening:

» Know your aircraft fuel system and how and when to operate associated controls such as fuel caps, fuel drains, fuel primer, fuel pumps, fuel selector and mixture control.

» Always ensure there is sufficient fuel for your flight, including reserves and diversion allowance, and that you use the dipstick to visually check fuel levels. Crosscheck the dipstick level with the fuel gauges for accuracy, and never rely on a single source of information about the fuel reading.

» Have a fuel plan even when operating in the circuit. Engine power loss occurrences have occurred during a 'touch and go' often as a result of a vigorous application of full throttle in a sometimes stressful situation. Also, fuel consumption will be higher in the circuit than when operating with a lean mixture in the cruise at altitude.

Induction Icing

Carburettor icing is a major factor in loss of engine power.

Remember that induction icing can occur at temperatures of -10° C to +35° C and above 50 per cent humidity. Also, know your aircraft systems, especially the use of carburettor heat or alternate air for fuel-injected engines in the case of restricted induction airflow.

Pre-flight Self-briefing

All single-engine aircraft pilots, just like multi-engine aircraft pilots, should 'self-brief' before each and every takeoff. It helps you keep ahead of the aircraft, and keep control.

This brief is generally conducted once all engine and systems checks are complete, just prior to the holding point for takeoff. It serves as a reminder of your planned actions in the event of an emergency.

Here is an example of a self-brief:

> *Engine failure before rotation point, I will abort the takeoff, close the throttle and stop on the remaining runway.*
>
> *Engine failure after rotate, runway remaining, I will lower the nose, close the throttle, land in the remaining runway available.*
>
> *Engine failure in initial climb, I will lower the nose, close the throttle, select the best option, and execute trouble checks if time permits.*

On the takeoff run, we wisely choose to use the full length of the runway available, and on application of full power we check the static RPM to confirm engine performance.

With the brakes off we check the acceleration of the aircraft, and the performance of the engine for any signs of power loss and/or rough running.

After rotation and in the initial climb, any partial engine power loss that degrades performance to the extent that you cannot maintain height can be treated as a complete engine failure with a potentially extended glide distance.

At this point, you might hear your instructor reminding you to, "lower the nose to the gliding attitude, maintain speed, carry out trouble checks if you have time, and fly the aircraft to a landing."

You can now also consider how best to use the partial power you might have available.

At a reasonable height, and with power that is sufficient to maintain height, a turn back to the recently departed runway may be an option, but it has a number of considerations attached. The overriding thought is that the engine could fail at any time.

Accidents occur when control is lost, especially when the pilot attempts to turn back to the runway at low level and low speed, or does not maintain control in the glide.

Plan, inspect, and brief for a safe outcome after partial engine power loss, but remember to fly the aircraft! ■

Keeping Your **Exposition Relevant**

The CAA is making changes to the way it processes exposition amendments to make the procedure more effective.

An exposition is much more than just a regulatory requirement to demonstrate compliance with applicable Civil Aviation Rules. When used effectively, the exposition becomes a powerful management tool for both the decision-makers and employees, detailing the policies and processes that underpin the way the organisation goes about its day-to-day business. It's also an essential tool in building an organisation's safety culture.

Remember though, that the onus is on the certificate holder to maintain a compliant exposition (for example, rule 119.165(a)(1)). It's important to keep exposition manuals up to date and to notify the CAA when changes are made. You can see the requirements in the rules relating to your organisation certificate under the headings, "Continued compliance" and "Changes to the certificate holder's organisation".

Amendments

All exposition amendments should now be sent directly to the CAA library. We'd prefer that you send submissions in an electronic format and email to: library@caa.govt.nz. Paper copies can still be sent to: CAA Library, PO Box 3555, Wellington 6140, New Zealand. Sending us a link to an intranet address or portal is not sufficient; the CAA requires a copy to retain on file.

How an amendment is processed by the CAA will depend on the nature of the amendment and whether the changes made require prior acceptance by the Director or not.

You can find out if you need prior acceptance in the rules applicable to your organisation certificate.

Organisation Changes

As your business grows and adapts, exposition amendments are made to reflect the natural, ongoing changes to your aviation processes. When these do not require prior acceptance by the CAA, the Information Services team will file them directly into our library.

Prior Acceptance

Amendments that require prior acceptance before they are filed need to be assessed by a CAA inspector on behalf of the

The onus is on the certificate holder to maintain a compliant exposition

Director. When you submit amendments that require prior acceptance, it is essential that you attach the application form for amendment of your organisation certificate.

The certificated organisation cannot execute any changes until they have received a formal notice of acceptance from the CAA.

Summary Sheet

To assist you in submitting amendments correctly, the CAA is providing summary sheets (for example, Form 24115/08). You can use these to detail the changes made to exposition documents and assess what type of submission to make. It is helpful to send these in with your exposition changes.

Improvements

Xavier Ruch, CAA Operations Support Analyst, believes that the increased efficiency of document management and amendment processing will create time and cost savings for commercial aviation organisations and the CAA.

"We've made the submission of routine amendments easier by using one address. At the same time, we need to emphasise the certificate holder's responsibility to submit changes correctly. That means we will be more confident we have the right information," says Xavier.

Tips

An electronic format is preferred for exposition amendments. The preferred file format is PDF, but MS Word, and Open Office are also acceptable. Please use a consistent file naming convention. Keep file names short, and format dates using "yyyymmdd".

When naming a specific manual, start the name with the organisation name you are certificated under, or your CAA participant number. Next, identify the manual with a rules part number or an abbreviated form of the manual name, eg, "MAINT" for Maintenance Manual. Finally, add information that will indicate the exposition revision status. This may be a revision number or date of revision (or both if you like).

Each manual submitted should have its own list of effective pages (LEP) and revision status to avoid possible confusion. When revising a manual, the LEP and revision status needs to be amended every time a section in the manual is revised.

In addition, if a particular page is revised, the page's updated revision status should match the entry in the LEP, as well as the LEP's revision status.

One electronic file per manual is easier to manage than separate files for each section or page. To keep sections manageable, each section can be page numbered as "section 2 page 3", or similar, followed by the revision status.

If you require a receipt when submitting your amendment, you can either use the email "read receipt" setting, or request a receipt in your email, but don't make the mistake of interpreting a receipt as acceptance of the changes. ■

Aviation **Spectrum Group**

The Aviation Spectrum Group (ASG) represents the interests of the aviation community in the use of, and particularly the protection of, the radio frequency spectrum for aeronautical communications, navigation, and surveillance. Representatives of all facets of the industry have been meeting periodically since 2004. On 1 May 2013, a milestone was reached with their 20th meeting, held at the CAA offices in Wellington. It was chaired by Dr Alan Jamieson, a subject matter expert contracted to the CAA.

The ASG works with the Ministry of Economic Development in formulating common positions of radio spectrum use for presenting to international forums, in particular the International Telecommunication Union (ITU) World Radio Conference, which will next be held in late 2015. Items to be discussed include Fixed Satellite feeder links for unmanned aircraft systems, and wireless avionics intra-communication for aircraft.

Background information on the ASG as well as the meeting reports can be found on the CAA web site, www.caa.govt.nz, "Aeronautical Services – Aeronautical Telecommunications".

Radio Frequency in Uncontrolled Airspace

The submission period for the CAA discussion document, "Appropriate radio frequency for use outside controlled airspace", closed on 24 May 2013.

The discussion document sought to clear any ambiguity in the core safety issue of radio frequency use in uncontrolled airspace, by seeking industry input on three issues:

» The Massey University School of Aviation nationwide CFZ proposal.

» The CAA proposal to reinforce that FISCOM is to be used outside controlled airspace unless within an MBZ, CFZ, or aerodrome traffic circuit. This includes increases to FISCOM radio frequency coverage and geographical areas.

» Amending *AIP New Zealand* ENR 1.1 Section 6.2 for the broadcast area, to change it from below 3000 feet to below 2000 feet as per Appendix A.

The discussion document and the Massey proposal are available on the CAA web site, www.caa.govt.nz, "Airspace – Airspace Review". A summary of submissions will be published when completed.

For more information, contact Mike Haines, Manager Aeronautical Services, mike.haines@caa.govt.nz.

METAR AUTO for International Airports

Over the last few months a proposal from MetService to upgrade their aerodrome meteorological observing (METAR) programme at Auckland, Wellington and Christchurch international airports from manual processes to a fully automated process has been discussed with the primary stakeholders.

This work has included detailed talks with the CAA, Airways Corporation, domestic and international commercial users of the aerodromes, the RNZAF, pilot representatives, and primary general aviation users.

The systems proposed by MetService are similar to those already providing METAR AUTO at the domestic aerodromes but with added back-up and contingency, the addition of web cams, and implementation of enhanced oversight systems.

The proposal exceeds international standards for the provision of METAR AUTO at international aerodromes as set out by ICAO. METAR AUTO provides reports every 30 minutes and obviates the need for SPECI reports.

The consultation has been completed, and the CAA has approved the proposed changes. Implementation is expected in August 2013. The AIP will be amended to reflect these changes.

Flight Instructor Seminars 2013

The CAA is holding its biennial Flight Instructor Seminars in August this year. The seminars run from 0900 to 1630 hours and cost $50 to register, including lunch.

To see the programme and/or to register, check out the CAA web site, www.caa.govt.nz, "Seminars and Courses". We'll also have an update in the next *Vector*.

Wellington – Thursday, 8 August

Christchurch – Thursday, 15 August

Auckland – Thursday, 22 August

New **Rules Poster**

An updated version of the *Civil Aviation Rules and Advisory Circulars* poster is enclosed with this issue of *Vector*.

The poster can be put up on the office or briefing room wall. Make sure you replace the older version with this year's poster. It's a different colour to make it easier to identify.

The latest information on Rules and Advisory Circulars is on the CAA web site, www.caa.govt.nz.

For free copies of this poster, email: info@caa.govt.nz.

Hourly Rate Increase

Last year, following a major review, the Government agreed to a range of changes to the CAA's fees, charges and levies. One of the changes was a progressive increase, over three years, of hourly charges for surveillance and certification functions. The second of these progressive increases will take effect 1 July 2013, when the standard hourly rate will increase from $208 to $244 per hour, including GST.

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

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

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

Planning an Aviation Event?

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

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

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

CAA Cut-off Date	*Airways Cut-off Date*	*Effective Date*
10 Jun 2013	17 Jun 2013	22 Aug 2013
8 Jul 2013	15 Jul 2013	19 Sep 2013
5 Aug 2013	12 Aug 2013	17 Oct 2013

See **www.caa.govt.nz/aip** to view the AIP cut-off dates for 2013.

Aviation Safety Advisers

Aviation Safety Advisers are located around New Zealand to provide safety advice to the aviation community. You can contact them for information and advice.

Don Waters (North Island)
Tel: +64 7 376 9342
Fax: +64 7 376 9350
Mobile: +64 27 485 2096
Email: Don.Waters@caa.govt.nz

Murray Fowler (South Island)
Tel: +64 3 349 8687
Fax: +64 3 349 5851
Mobile: +64 27 485 2098
Email: Murray.Fowler@caa.govt.nz

John Keyzer (Maintenance, North Island)
Tel: +64 9 267 8063
Fax: +64 9 267 8063
Mobile: +64 27 213 0507
Email: John.Keyzer@caa.govt.nz

Bob Jelley (Maintenance, South Island)
Tel: +64 3 322 6388
Fax: +64 3 322 6379
Mobile: +64 27 285 2022
Email: Bob.Jelley@caa.govt.nz

Aviation Safety & Security Concerns

Available office hours (voicemail after hours).

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

Accident Notification

24-hour 7-day toll-free telephone

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

Accident Briefs

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

ZK-RAW Rotor Flight Dominator

Date and Time:	14-May-11 at 11:20
Location:	Awanui
POB:	2
Injuries (Fatal):	1
Injuries (Serious):	1
Damage:	Destroyed
Nature of flight:	Private Other
Age:	50 yrs
Flying Hours (Total):	496
Flying Hours (on Type):	400

During an abrupt 180-degree reversal turn, the gyroplane descended rapidly and struck the ground. The pilot was killed and the passenger seriously injured. The safety investigation concluded that the gyroplane departed controlled flight, probably as a result of the rotor being unloaded during the turn.

A full report (and also for ZK-YTW) is available on the CAA web site.

CAA Occurrence Ref 11/2157

ZK-YTW Aerostar Yak-52TW

Date and Time:	23-Jan-12 at 10:45
Location:	Timona Park, Feilding
POB:	2
Injuries (Fatal):	2
Damage:	Destroyed
Nature of flight:	Aerobatics
Pilot Licence:	Private Pilot Licence (Aeroplane)
Age:	51 yrs
Flying Hours (Total):	2900
Flying Hours (on Type):	52
Last 90 Days:	65

About 1035 hours on 23 January 2012, the pilot and a colleague took off from Feilding Aerodrome in ZK-YTW, for an aerobatic flight. Some 10 minutes later, a number of local residents observed the aircraft complete a slow roll then enter a steep dive. The aircraft continued descending steeply and struck the ground in Timona Park, Feilding. The aircraft was destroyed and both occupants were killed.

A CAA field investigation determined that a screwdriver had entered the elevator control mechanism during an aerobatic manoeuvre, and restricted control movement. As a consequence, the pilot was unable to maintain control of the aircraft. The CAA has issued an AD mandating the fitting of a barrier into the rear fuselage.

CAA Occurrence Ref 12/218

ZK-HBJ Bell 206B

Date and Time:	13-Dec-11 at 19:30
Location:	Tikokino
POB:	1
Injuries:	0
Damage:	Substantial
Nature of flight:	Other aerial work
Age:	44 yrs
Flying Hours (Total):	1549
Flying Hours (on Type):	42
Last 90 Days:	62

While returning to the loading area, the pilot flew the helicopter through what he believed to be a gap in the adjacent power lines, where the wires were routed underground.

He stated that he was preoccupied with a problem that could have waited until after landing, and did not notice that he had missed the gap.

The helicopter struck the span next to the gap, breaking off the main rotor pitch links, resulting in a heavy ground impact.

CAA Occurrence Ref 11/5575

ZK-FGZ Cessna 182N

Date and Time:	18-Feb-12 at 17:35
Location:	Mercer
POB:	1
Injuries:	0
Damage:	Substantial
Nature of flight:	Parachuting
Pilot Licence:	Commercial Pilot Licence (Aeroplane)
Age:	22 yrs
Flying Hours (Total):	302
Flying Hours (on Type):	4
Last 90 Days:	6

The aircraft engine stopped on final approach after a parachute dropping flight, causing it to land in a paddock short of the runway. The pilot confirmed that the aircraft had probably run out of usable fuel, having made several previous flights.

The pilot had just been type-rated on the Cessna 182 and had miscalculated the fuel requirements for this type of operation. He has since expanded his knowledge of fuel requirements under various operating conditions.

CAA Occurrence Ref 12/766

ZK-COZ Puffer Cozy

Date and Time:	23-Dec-11 at 12:05
Location:	Tauranga
POB:	1
Injuries:	0
Damage:	Substantial
Nature of flight:	Test
Flying Hours (Total):	800

Just after the aircraft had lifted off, the canopy opened fully. The pilot discontinued the takeoff, landing back on the grass strip. The landing was heavy, with the aircraft sustaining substantial damage.

The canopy opening was due to two factors:

The main canopy latch was not secured. It was either not engaged correctly when the canopy was closed, or it may have become disengaged through vibration during the takeoff roll.

The back-up safety catch did not operate as intended. It was found that the spacer on the safety catch was of a larger diameter than the plans specified. This made the alignment of the catch more critical, and it may not have 'caught' the screw head on which it would normally engage. The larger spacer would have reduced the distance between itself and the screw head, making it easier for the safety catch to disengage with vibration.

Additionally, the aircraft technical support engineer advised that it is also possible that adjustment of the standard latch pushrod can interfere with the safety catch (SC-1), so that if the standard catch comes loose, the pushrod pushes the safety catch away from the screw/spacer just enough so that it doesn't catch. The safety catch may also be susceptible to fatigue cracking, being easily bent, and cracking at the 90-degree bend with only a hard jolt required to break off the retaining piece. With the catch being easily bent, there is also the possibility that a 5 or 10-degree bend inward of the catch would easily prevent it from engaging as the canopy rises.

CAA Occurrence Ref 11/5688

ZK-HKT Robinson R22 Beta

Date and Time:	15-Mar-12 at 19:30
Location:	Manapouri
POB:	1
Injuries:	0
Damage:	Substantial
Nature of flight:	Hunting
Pilot Licence:	Commercial Pilot Licence (Helicopter)
Age:	33 yrs
Flying Hours (Total):	1423
Flying Hours (on Type):	190
Last 90 Days:	79

On a venison recovery operation, the pilot placed the right-hand door in the cockpit and strapped it in for the return flight to base. During lift into the hover, the exposed dual cyclic socket became caught on the door hinge, jamming the cyclic and resulting in a dynamic rollover.

CAA Occurrence Ref 12/1154

N298WA Beech B58

Date and Time:	28-Feb-12 at 15:57
Location:	North Shore
POB:	2
Injuries:	0
Damage:	Substantial
Nature of flight:	Private Other
Pilot Licence:	Private Pilot Licence (Aeroplane)
Age:	73 yrs
Flying Hours (Total):	1372
Flying Hours (on Type):	437
Last 90 Days:	6

During takeoff, the pilot realised there was an abnormally low airspeed indication, and decided to discontinue the takeoff. The main wheels 'locked up' under full braking, and the aeroplane ran off the end of the runway on to soft ground, which caused the nose wheel to collapse.

The pitot cover had not been removed before flight.

CAA Occurrence Ref 12/867

ZK-CRY NZ Aerospace FU24-954

Date and Time:	08-Apr-12 at 12:20
Location:	Waitetuna
POB:	1
Injuries:	0
Damage:	Substantial
Nature of flight:	Agricultural
Pilot Licence:	Commercial Pilot Licence (Aeroplane)
Age:	42 yrs
Flying Hours (Total):	1519
Flying Hours (on Type):	915
Last 90 Days:	230

The pilot assessed the airstrip before commencing a lime-sowing job and believed the strip was usable, albeit rather rough after the midpoint. On landing after distributing 13 loads, the right-hand main gear brake caliper broke. The pilot believed the rough surface to be the cause, and asked the farmer to smooth it out. While the pilot returned to base for repairs, the farmer used a 'roto-tiller' on the strip, and on his return, the pilot assessed the cultivated area as suitable. While the pilot was spreading the 14th load, the farmer started to work on the area again.

The pilot circled until the farmer had finished, then landed over the reworked area. On the subsequent takeoff roll, as the aircraft entered the cultivated area, it started to decelerate rapidly, and the right main gear broke off flush with the wing. The pilot started jettisoning the load and the aircraft became airborne while yawing to the right. It collided with trees but the pilot was able to land the aircraft in an adjacent paddock.

CAA Occurrence Ref 12/1558

GA Defects

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

Key to abbreviations:

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

Eurocopter EC 130 B4

T2 disk and shroud

Part Model:	Arriel 2B1
Part Manufacturer:	Turbomeca
ATA Chapter:	7200

An abnormal noise was heard from engine during the initial post-maintenance start, combined with increasing T4 and decreasing NG indications. The start was aborted, and an attempt at motoring the engine over was unsuccessful, due to severe internal engine interference. An over-temperature of 871 degrees for 1 second was recorded.

A borescope inspection was carried out and rub noted between T2 disk and its shroud. The rub decreased notably as the engine cooled. The engine was removed by the maintenance provider, and was subsequently examined and repaired. It was found that the turbine nozzle guide vane inner ring was slightly out of round in two areas 180 degrees apart, possibly due to the high cycle count on the engine.

The high pressure turbine (T2) disk and the shroud and inner shroud segments were replaced. The Maintenance Technical Instruction (MTI) states a minimum diameter of 180.80 mm is required for the shroud inner segments and the diameter of the high pressure turbine.

The original turbine disk diameter was 180.01 mm, resulting in a clearance of more than 0.40 mm (manufacturer minimum). It was noted that checking this is not part of the normal procedure for the work carried out. The Turbomeca NZ agent put forward a recommendation to the company that a dimensional check should be included in the technical instruction. The Turbomeca Head of Deep Maintenance will review the recommendation and if merited, a change will be made to the MTI.

This was the first reported occurrence of this problem recorded worldwide for the Arriel 2B1 engine.

CAA Occurrence Ref 12/2893

Cessna 208

Pitot/static system

ATA Chapter:	3421

On a scheduled flight from Wellington to Nelson, the pilot noticed abnormal indications on the static instruments and attitude display. When the alternate static air source was selected, the indications 'jumped' slightly, and returned to normal.

During descent, the indicated airspeed reduced significantly, then started to increase, before dropping to zero. A short time later, the electronic flight instrument (EFIS) display showed a "Cross Check Attitude" warning caption, before all attitude indications disappeared and an "Attitude Fail - Check Pitot Heat" caption was displayed. The pilot requested radar readouts and verified that the instruments on the right-hand panel were reading correctly, and continued with the descent. Visual conditions were encountered soon after, enabling a visual approach.

Engineering investigation included the draining of accumulated moisture from the static system, but this was only partially successful, with abnormalities occurring on the next flight. The aircraft was ferried to Omaka for further investigation, which found more water in the system, and partial blockage of the static ports on the left-hand pitot head, due to corrosion. The pitot head was later replaced, and company procedures were revised to include actions in the event of suspected water in the static system, and training to include EFIS failures. The EFIS inputs include static and dynamic air pressures, and will discontinue the attitude display when discrepancies are detected.

CAA Occurrence Ref 12/2656

Robinson R66

Clutch

Part Manufacturer:	Robinson
Part Number:	F018-1
ATA Chapter:	8300
TTIS Hours:	37.4

As a result of vibration being felt in the helicopter, engineering inspection found that the clutch retainer bolt had failed, resulting in destruction of the retainer ring, and damage to the engine gearbox housing and rear cover. All damaged items were replaced, the manufacturer was informed by the engineers, and the FAA was informed by the CAA.

CAA Occurrence Ref 12/4949

Cessna 182Q

Propeller blade plugs

Part Model:	C200 Series
Part Manufacturer:	McCauley
Part Number:	C2A34C204-C
ATA Chapter:	6110

During disassembly of the propeller for inspection, it was discovered that the blade plugs had been drilled for lockwire, and the screw that secures the plug to the blade was lockwired. This had occurred on both blades. The overhaul manual calls for Loctite sealant only on the screws.

The two LAMEs who identified the defect had never seen this type of locking before. Investigation into the maintenance history of the propeller could not establish when or where this action had been performed. The manufacturer was contacted and pending their response, the propeller inspection was completed, the lockwire was removed and the screws secured using Loctite in accordance with the Overhaul Manual. The prop was then released to service.

The redundant hole in the plug was not deemed at this time to be an airworthiness issue. The response from the manufacturer was then received, stating that since there is no supporting documentation on drilling the blade plugs, it is the manufacturer's position that these blade plugs are to be replaced and new blade plug screws be retained with Loctite as per the Overhaul Manual. The owner/operator was informed of the manufacturer's response.

CAA Occurrence Ref 12/2117

Pacific Aerospace 750XL

Forward attachment fitting

Part Manufacturer:	Pacific Aerospace
Part Number:	11-10281-1
ATA Chapter:	5550
TTIS Cycles:	17470
TTIS Hours:	7313

During scheduled inspection, the vertical stabiliser forward attachment fitting was found cracked. The operator then inspected the rest of the fleet, identifying one further cracked fitting. Both aircraft are employed in an agricultural role, and it is believed that due to the rigours of the agricultural operations, the fittings cracked from fatigue. The manufacturer was informed and has issued a Service Bulletin.

CAA Occurrence Ref 12/4698

Robinson R44 II

Tail rotor blade

ATA Chapter:	6410

During a post-flight inspection, the pilot found a chordwise crack in the tail rotor blade skin, radiating from the leading edge. The blades were replaced in accordance with Robinson Helicopter Company Service Bulletin 83.

CAA Occurrence Ref 12/4087

Aerospatiale AS 350B2

Main fuel feed line

Part Manufacturer:	Honeywell
Part Number:	LTS101-700D-2
ATA Chapter:	7310
TTIS Hours:	86338

During approach on a post-inspection test flight, a strong smell of fuel was noticed by the pilot. After shutdown, fuel was found leaking from the main fuel feed to the engine-driven pump, at the inlet union.

The line union was found to be incorrectly torqued. The union was re-torqued, lockwired, and leak checked.

CAA Occurrence Ref 12/4847

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