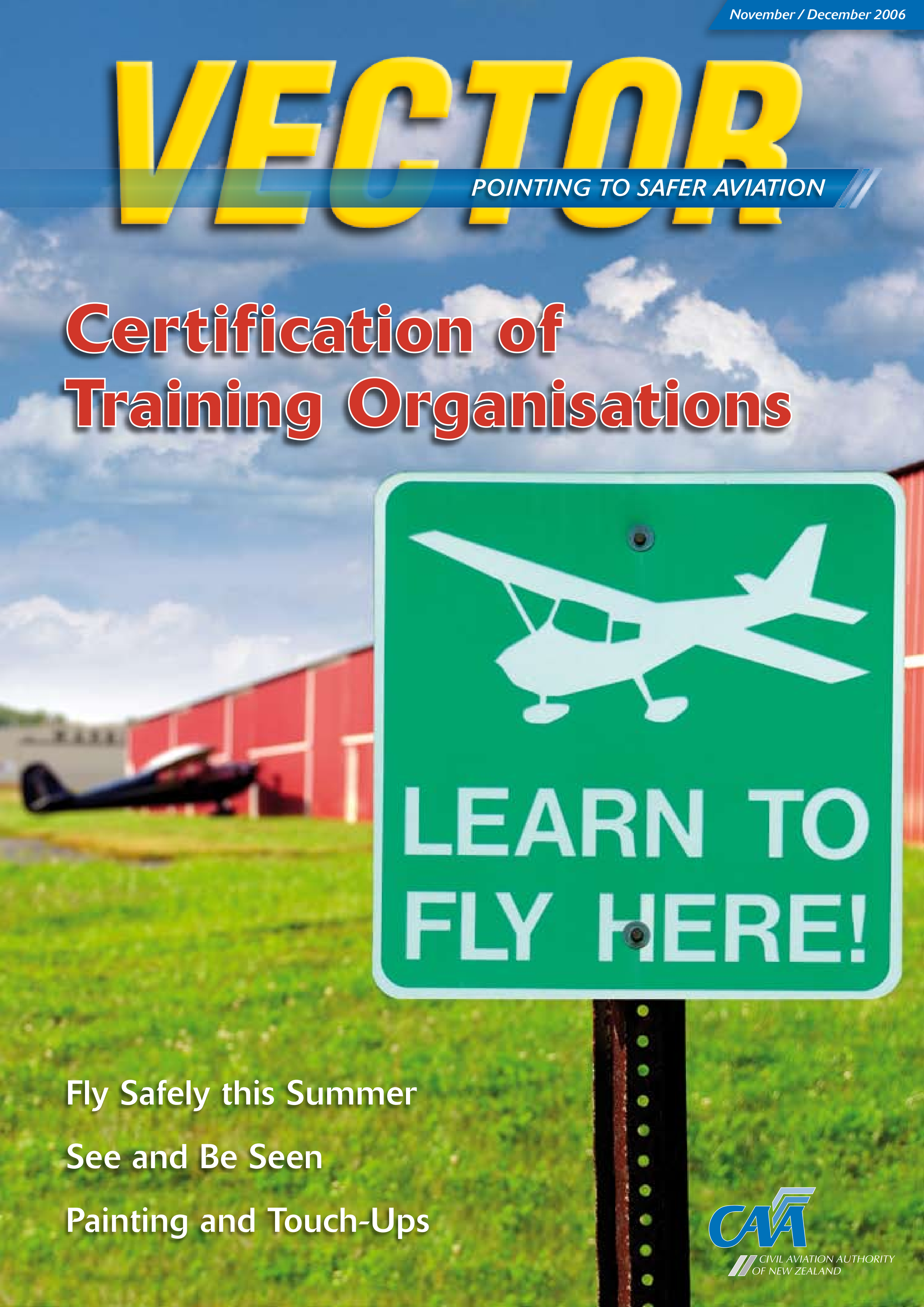
November / December 2006

VECTOR

POINTING TO SAFER AVIATION

Certification of Training Organisations



Fly Safely this Summer

See and Be Seen

Painting and Touch-Ups

CAA
CIVIL AVIATION AUTHORITY
OF NEW ZEALAND

VECTOR

In this issue...

Certification of Training Organisations

The Part 61 Stage 3 NPRM will be published shortly. These rule amendments propose that all training and assessment required by Part 61 for the issue of a pilot licence or rating be undertaken by Part 141 certificated organisations. Four different types of training organisation certificate are proposed.

Fly Safely this Summer

Summer means that a lot more flying takes place, and the CAA runs the Fly Safely this Summer campaign to remind people to check themselves and their aircraft for currency, and to be extra vigilant in the air, especially in looking out for other traffic. Some of the special events this summer are highlighted to increase awareness of increased traffic in the air.

See and Be Seen

Your eyes will only see what you want them to see. If your mind is on other things you might not see approaching traffic until it is too late. Reduce your chances of a close encounter by using proven scanning techniques.

Painting and Touch-Ups

Professional advice should be sought before painting an aircraft. Whether it's a small touch-up or a complete repaint. Here is some advice on areas to watch out for, and the do's and don'ts for those who have built their own aircraft.

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Certification of Training Organisations

Upcoming NPRM – Part 61 Stage 3

An NPRM will shortly be published detailing proposed amendments to Civil Aviation Rules, Part 61 *Pilot Licences and Ratings*, and associated changes to Part 1 *Definitions and Abbreviations*, Part 12 *Accidents, Incidents, and Statistics*, and Part 141 *Aviation Training Organisations – Certification*. This NPRM is stage three of a project to address pilot training issues through changes to Part 61.

Background

In 1997, the CAA received a petition from the Aviation Industry Association for rule amendments to require Part 61 training to be conducted by Part 141 certificated organisations. This petition was included in a wider CAA review of Part 61 begun in 2000. A Technical Study Group (TSG) was established to review the range of issues involved. One of the recommendations in the TSG's final report was for flight training to be undertaken by certificated training organisations.

New Zealand is one of the few countries where pilot training is not conducted by approved training organisations. ICAO also recommends that pilot training be conducted by organisations approved by the State.

The proposal

The rule amendments in the NPRM propose that all training and assessment required by Part 61 for the issue of a pilot licence or rating, be undertaken by a person operating under the authority of an aviation training organisation certificate, issued in accordance with Part 141. The NPRM also proposes to establish four types of training organisation certificate:

- **Aviation Training Organisation Certificate.** For all Part 61 pilot licence and rating training including Biennial Flight Reviews. This certificate also covers flight tests and assessments required under Part 61.
- **Flight Training Organisation Certificate.** For conducting private pilot licence, type rating and aerobatic rating training. This certificate also covers Biennial Flight Reviews.
- **Special Training Organisation Certificate.** For specialist training, including dangerous goods training and security training.
- **Restricted Training Organisation Certificate.** For a single training course, to be held during a specific period.

General

The proposed amendments will mean that a person holding a Flight Instructor Rating may exercise the privileges of their rating only under the authority of an organisation holding a Part 141 certificate. Additionally, any ground-based training, or assessment required under Part 61, must also be conducted by an organisation holding a Part 141 certificate.

Part 141 certification ensures training organisations have specific structures and systems in place, including an organisational exposition, enabling oversight by the CAA.

The introduction of certification for flight training providers will produce a range of benefits to the trainee, the trainer and the regulator. These benefits add to the integrity and output of the aviation system as a whole, resulting in increased safety for the student pilot and the training organisation.

For a trainee pilot, the certification of a flight training organisation gives them an assurance that the training provider has a system in place that meets CAA standards and that the CAA provides oversight of that organisation.

For the flight training organisation, certification will require the implementation of systems to a set minimum standard. This will help to bring a structured and systematic approach to the way they conduct training.

For the CAA, certification will enable the regulator to have better oversight of aviation training and an improved capacity to address areas where performance is below minimum standard. It will also allow the CAA to monitor the industry situation more effectively and identify areas where training standards need attention.

Certification of training organisations also provides consistency to flight training across the New Zealand aviation system.

Once published, the NPRM will be available on the CAA web site, www.caa.govt.nz, under "Rules & more". A series of seminars covering the proposed rule amendments will be conducted in the near future. Seminar dates, times and venues will also be advertised on the CAA web site, once the details have been confirmed. ■

Fly Safely this Summer

The CAA's General Aviation Group has launched its "Fly Safely this Summer" campaign. Some exciting safety initiatives will be rolling out over the next few months from the General Aviation Group.

The Rotary Wing Unit will once again embark on an ambitious education programme targeting private helicopter owners. "There is a disproportionate number of accidents and incidents in the private sector of the helicopter community", says John Fogden, Manager Rotary Wing.

In an effort to reduce these accidents and incidents, Don Waters, Field Safety Adviser, will be contacting every private helicopter pilot and owner in his region to highlight the importance of a thorough knowledge of the aviation safety issues involved. He will be highlighting areas such as flight currency, flight following, risk management, and pilot maintenance.

The Sport and Recreation team will be seen at most of the fly-ins around the country. Particular attention will be paid to checking Annual Condition Inspections.

The Airworthiness Unit will be conducting spot checks on Part 43 maintenance providers. The spotlight will be on the calibration of their tooling. Torque wrenches, leak-down testers, and micrometers all need to have their paperwork in order.

The Fixed Wing Unit is going to target Part 135 organisations. This will involve spot check surveillance to monitor operational and airworthiness compliance. Observation flights will be conducted where arrangements can be made with operators.

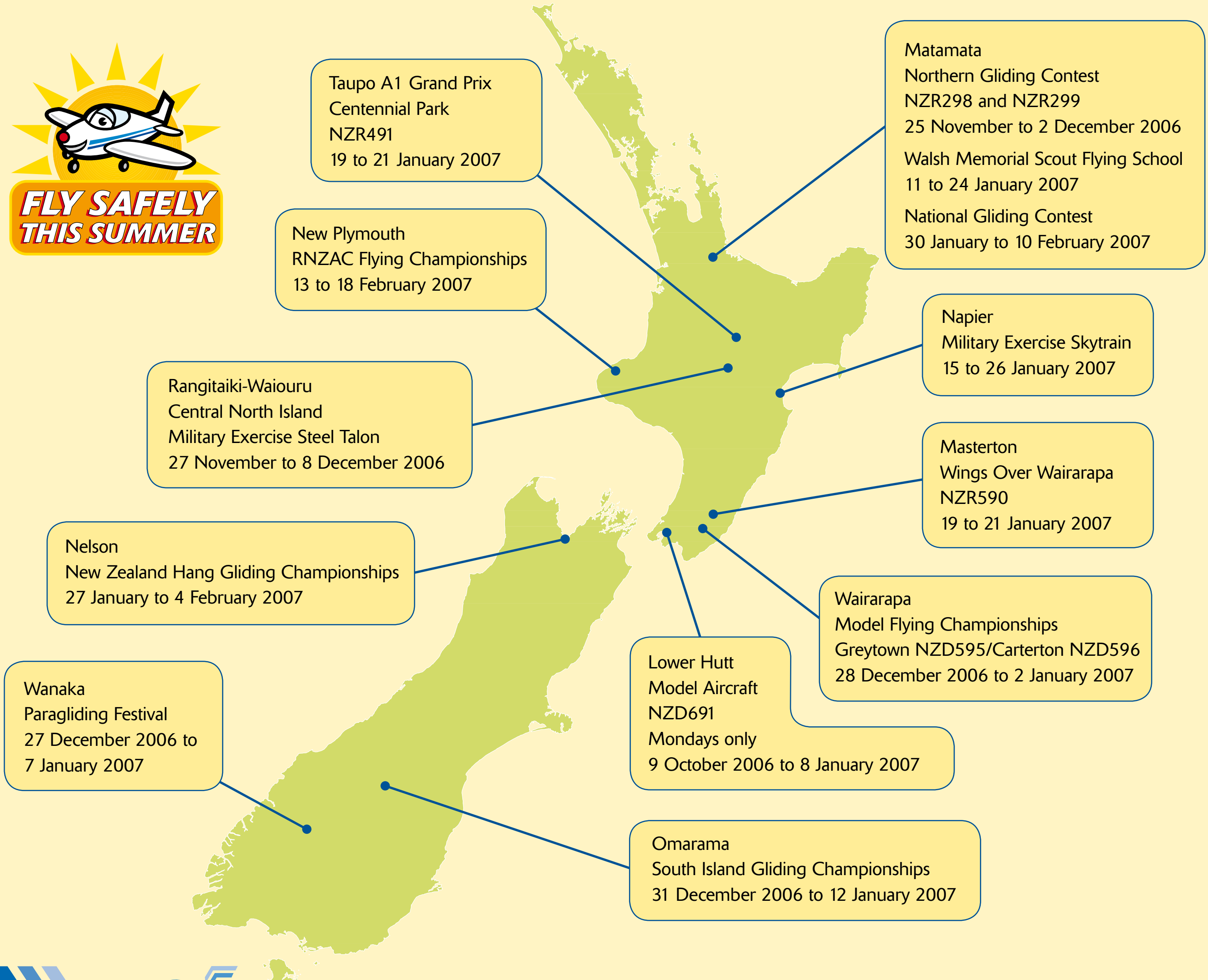
The timing of these initiatives will coincide with the typical increase in recreational flying over the summer period. Remember, before you go out flying this summer, there is no substitute for good pre-flight planning. To help you, we're highlighting the special events that we have been informed about.

Summer Traffic Busy Spots

This summer looks set to be a busy one – this map shows the known flying events planned between December 2006 and mid-February 2007 – these events will involve intense flying activity, but also be aware of the increased traffic in the air as people fly to and from the events.

These are just the events we know about at this date – always check your *Aeronautical Information Publication (AIP) Supplement* for planned events and, of course, also refer to NOTAMs.

If you do not subscribe to *AIP New Zealand*, you can download a copy of the *Supplement* at no cost from www.aip.net.nz. ■



Close Encounters of the Worst Kind

Map: Sample only

Early in 2006, there was a fatal mid-air collision between two training aircraft in Class G airspace in the Manawatu area. There have been subsequent reports of close encounters in the same area, highlighting the intensive aircraft activity, and the fact that aircraft operate on different frequencies.

The airspace to the south of the Ohakea and Palmerston North control zones, between the coast and the Tararua range, is sometimes loosely called the 'training area' but it is not formally designated as such. Training aircraft from Palmerston North, Feilding, Foxpine, Kopoturoa (microlight strip to the north of Levin), and Ohakea all use the area. There may be agricultural aircraft operating in the area, as well as aircraft in transit.

Safe operation in this intensively used airspace requires the use of appropriate radio frequencies, timely and accurate position reporting, situational awareness, and the application of the Part 91 'right-of-way' rules.

Radio Use

In class G airspace, there is normally no specifically assigned frequency. Transiting traffic may be on 121.3 MHz, which is the designated FISCOM frequency. Local traffic from Foxpine and Kopoturoa will normally be on 119.1 MHz, and local Palmerston North traffic sometimes remains on 120.6 MHz when close to the Palmerston North control zone. Additional complications are aircraft using company frequencies, and the use of 125.1 MHz by aircraft intending to transit Ohakea airspace.

The use of multiple frequencies in the area could lead to pilots having incomplete traffic information. As a consequence, all operators in the area have been encouraged to listen out and make position reports on 119.1 MHz once clear of controlled airspace, and report as "Manawatu traffic".

Position Reporting

Because of the concentration of traffic in this airspace, brief and accurate position reporting is critical. If both the reported location and altitude are accurate, other pilots will know immediately where to look.

"At Tokomaru" means that you are *overhead* Tokomaru. It does not mean 'in the general vicinity of Tokomaru'. If you are nearby, be precise. For example "one mile to the south of Tokomaru", if that is where you are. Avoid reporting "abeam" somewhere – this expression is meaningless.

Sometimes it can also be helpful to inform other traffic that you are leaving the frequency. For instance, "Manawatu traffic, Cherokee ABC, Longburn, 1400 feet, changing to Palmerston Tower".

Situational Awareness

When operating in busy uncontrolled airspace you need to build a mental picture of what is happening in the airspace, and keep updating it. You need to know where other aircraft are and what they are doing, and relate this to what you are doing.

The practice of 'see and avoid' applies. More accurately, it might be described as 'search for, detect and respond'. See our article 'See and be Seen' on page 6.

Make yourself visible (beacons, strobes, landing and taxi lights on), do an active visual search for traffic, and ask for further information if at all in doubt about another aircraft's position report. Other pilots will be doing the same – looking out and seeking accurate information to navigate away from a potential conflict situation.

Right-of-Way Rules

Rule 91.227 *Operating near other aircraft* requires a pilot to operate an aircraft in such a way as not to create a collision hazard; and rule 91.229 *Right-of-way rules* requires a pilot to maintain a visual lookout so as to see and avoid other aircraft, *regardless of whether the flight is IFR or VFR*. The same rule prescribes that the aircraft with right-of-way shall "maintain heading and speed" – but of course not at the risk of collision. An aircraft giving way must avoid passing over, under, or in front of another aircraft unless well clear, bearing in mind the effect of wake turbulence.

Aircraft approaching head-on both turn right. If aircraft are converging at approximately the same altitude, the aircraft with the other on its right gives way, although there are exceptions for such categories as airships, gliders, balloons and towing aircraft – see the full rule. If you are overtaking another aircraft, and need to turn to achieve this, do so to the right. It is important that you are familiar with these rules so that you can react immediately when required.

Summary

- Look out.
- Listen out.
- Report accurately.
- Be visible.
- Build a mental picture of other traffic.
- Know in advance what to do in a conflicting situation.
- Assume nothing – check. ■

See and Be Seen

How to avoid a mid-air collision

In New Zealand in recent times we have experienced at least six mid-air collisions and well over 200 reported near misses. As air traffic has increased, so has the importance of a good lookout if you are to avoid the possibility of a mid-air collision.

You usually see only what your mind lets you see. If your mind is on other things, you might not see approaching traffic – until it is too late.

One disadvantage your eyes encounter in flying is the time they require for accommodation.

They automatically adjust (accommodate) when you look at objects that are near, and then move your field of sight to an object that is in the distance, and vice versa. Changing your focus from the instrument panel to an aircraft a mile or so away, can take two seconds or more – a slow process when as much as 10 seconds can be needed to see and avoid another aircraft on a collision course.

A heightened problem can develop above haze or a cloud layer, when there is no distinct horizon. With little or nothing for your eyes to focus on, although you are looking out, you do not consciously see anything – even conflicting traffic, should it enter your field of vision. This can be minimised by refocusing your eyes from something near, to an object in the distance. When an object becomes visible to only one eye, perhaps hidden from the other eye by a windscreen pillar, the blurred image you receive may not impinge on your mind.

Another difficulty is your eyes' narrow field of vision. Although they accept light from an arc of nearly 200 degrees, their focus is limited to about 10 to 15 degrees. This narrow field is the only area in which the eyes clearly identify objects. Though you sense movement with your peripheral vision, what we see 'out of the corner of your eye' is of little help.

A further complication in identifying conflicting traffic is that early on, an aircraft on a collision course appears to have no relative motion. It remains seemingly stationary, without appearing to grow in size. Then suddenly, as it gets really close, it balloons frighteningly to fill your whole windscreen. This means that marks on the windscreen could obscure it until it is much too close.

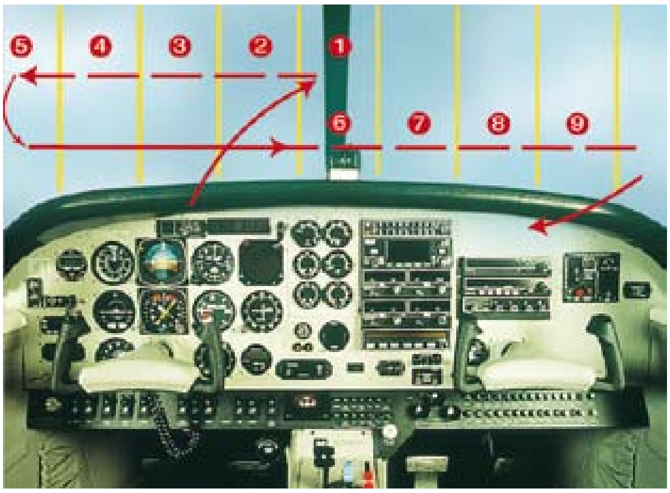
The environment can also limit effective vision. On cloudy or hazy days, you may be legally VFR, but at the minimum distance from cloud, conflicting traffic may be hard to detect. Glare, over a brightly lit cloud layer, or while flying directly into the sun, also makes traffic hard to see – and continuous scanning difficult.

The visual system is very sensitive to oxygen levels. Hypoxia will impair visual sharpness, peripheral vision, and colour vision.

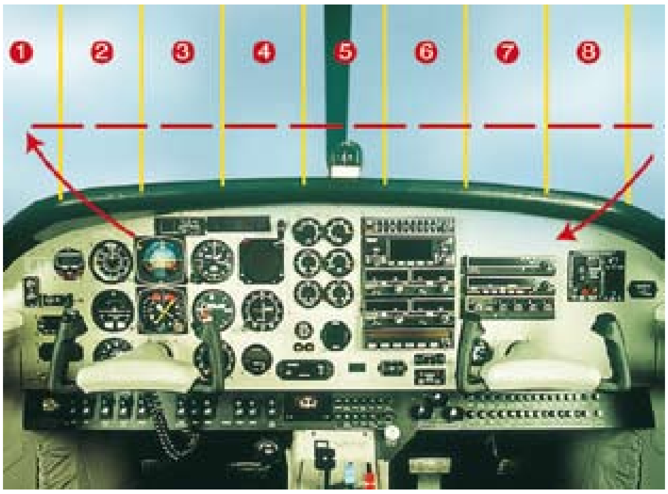
Scanning

Even light training aircraft on reciprocal headings can have a closing speed of over 200 knots. This makes seeing another aircraft in time to take avoiding action a challenge. A big part of the answer is effective scanning. In cruising flight, you need to scan an area 60 degrees to either side, not forgetting what can be seen from side windows. Scanning 10 degrees up and down horizontally is also a good idea, and allows you to spot any aircraft below and climbing, or above and descending. In high-wing aircraft there is a considerable blind spot created by the lower wing when in a turn. To partially overcome this problem you should lean forward to look through the side of the curved windscreen.

Scans that have proved themselves are based on the theory that traffic can



Example 1 – The centre-to-side pattern involves moving the eyes methodically from the centre of the visual field to the far left. The eyes then return to the centre and move right. This is followed by a brief scan of the instrument panel before the process is repeated.



Example 2 – The side-to-side pattern involves moving the eyes methodically from the far left of the visual field to the far right, pausing very briefly in each block of the viewing area to focus. This is followed by a brief scan of the instrument panel before the process is repeated.

be detected only through a series of eye fixations at different points, each becoming a field of focus. By fixating every 20 degrees, it should be possible to detect any contrasting or moving object in each visual block. Across the total scan area, this involves 9 to 12 blocks, each requiring one to two seconds for accommodation.

One method is to start at the far left of the windscreen and make a methodical sweep to the right, pausing each time to focus. The other is to start in the centre, moving progressively to the left, then swinging quickly back to the centre and repeating the performance to the right. While your head is moving, vision blurs, so unless a series of fixations is made, there is little likelihood of detecting all targets in the scan area.

Concentrate on critical areas. In the circuit, a systematic lookout before turns is crucial. This is due to the potentially large number of aircraft in close proximity to each other and the high workload. Start your scan by looking well back in the direction of the intended turn, raising/lowering the wing to give you a view above and below. Then move your eyes to scan back in the direction opposite to the turn and as far as the cockpit vision allows. Once this scan is complete, a turn can be initiated.

On descent and climb-out, make gentle 'S' turns to ensure no-one is in the way. On final do not fixate on the touchdown point. Look in front and behind this point for other traffic.

Summary

- Keep the windscreen, windows, and coaming clean and clear of obstructions.
- When cleaning windows, wipe in a vertical motion to reduce false horizons.
- Minimize head down time by having charts folded properly.
- Navigational lights and anti-collision beacons should be used at all times.
- Make accurate position reports and listen to other position reports to paint a situational picture.
- Scan constantly – 90 percent outside the aircraft, 10 percent inside the aircraft.

Adapted, with thanks, from Flight Safety Australia.

Water or Fuel

Early in our flying careers, we were taught as part of the pre-flight ritual to take a fuel sample from each of the various fuel drain points on our aircraft. Most of the time, these samples revealed nothing amiss, and occasionally we would be rewarded for our diligence by the appearance of a small amount of water at the bottom of the sample.

This sample shows 100/130 avgas above water – the division is quite apparent.

How did we know when all was well? The sample would be uniform with no water/fuel interface, the colour was as we expected, and it looked and smelt like the 'real McCoy'. Avgas used to be available in several octane ratings, each with its own distinguishing colour, but currently is available in only 100/130 octane, coloured green. Nowadays some engines (normally on private or sport aircraft) are permitted to run on motor gasoline (mogas), the colour of which also differs between octane ratings.

Jet A-1 (aviation kerosene), on the other hand, comes in one colour only, or more correctly, no colour at all. Much like water, really. To a helicopter pilot who took a sample drain from his Jet Ranger, the sample looked clear, smelt "about right", but there was something about it that aroused his suspicion. A water test capsule put the issue beyond doubt - the sample was all water, and the fuel tank took considerable further draining before actual fuel was encountered. Some maintenance action was required before further flight.

This subtle trap can also be encountered with avgas – be aware that in a narrow-gauge fuel drain receptacle such as those commonly carried on light aircraft, the fuel colour may be hard to distinguish, particularly in poor light or where the receptacle itself has discoloured over time. Usually any ambiguity can be resolved by smell, feel, and the behaviour of the sample when poured on a hard surface. Another strategy is to add water to the sample – if the sample is fuel, there will be an immediate separation of the water and fuel, and if the sample is all water, there will be no change in its appearance.

This sample is actually Jet A-1, but on appearance alone, is hard to distinguish from water.

There are several proprietary water-detection products on the market; however these are more often used with Jet A-1, which can contain suspended water, not visible to the naked eye. The danger with an excess of this suspended water is that it can precipitate out at low temperatures, and freeze in critical locations such as fuel filters and sumps.

Take the time, particularly when you are in a rush, to verify that the 'clear and bright' sample you have drawn from the fuel drain is actually fuel – not water. Water contamination still occasionally causes engines to fail at the most inconvenient times! Once you have confirmed that the sample is actually fuel, remember to dispose of it in an environmentally-friendly way, such as in a dedicated waste-fuel drum.

Further reading: GAP booklet *Fuel Management*.

Painting and Touch-Ups

While blowing the cobwebs off the old 172 you notice corrosion rearing its ugly head. The Kiwi 'can-do' attitude comes to the party. "I can fix that," I hear you say. Think again.

Painting an aircraft protects the aluminium, fabric, or composite material that covers the aircraft structure. Painting can also enhance aerodynamics and aesthetics. Harsh weather, in particular ultra violet-light, will break down the protective coating over time, creating the need to repaint.

It is strongly recommend that you seek professional advice when thinking about repainting or touch-ups on your aircraft. There have been many accounts of owners doing substantial damage to their aircraft, despite good intentions. The process of removing an area of paint, applying an undercoat, with a couple of top coats to follow, is not an easy undertaking. Garrick Andrews of Vincent Aviation has seen many botched paint jobs, "Post-stripping cleanup is critical if you are to avoid entrapment of residual chemicals under lap joints and other crevices and openings. If such residues are left under the new painted surfaces, premature corrosion can occur there. Worse still, the corrosion can become so severe that derivetting of the surfaces to remove and treat the corrosion may be the only option to stop its progress."

It has always been said, "if you are going to do a job, do it once and do it right". This has never been more true than with aircraft maintenance.

Even a small touch-up should be treated with the utmost respect. An enthusiastic pilot recently set to work on his aircraft and turned his standard rivets into flush mounted rivets with an orbital sander. All the damaged rivets had to be replaced.

Before you tackle repainting or touching-up your aircraft, check to make sure that you are permitted to carry out the work. For certified aircraft make sure you are familiar with Civil Aviation Rules, Part 43 *General Maintenance*, especially Appendix A *Pilot Maintenance*. The associated Advisory Circulars should also be studied for advice.

If your aircraft is a new amateur-built aircraft, and you are intending to paint it yourself, we strongly recommend that you seek advice and mentoring from the Sport Aircraft Association of New Zealand. If it is a repaint of an existing amateur-built aircraft, and you are not the builder, or you don't hold a maintenance approval, then refer to Part 43.

Poor preparation and painting caused this blistering.

The following advice relates to situations when you are permitted to carry out painting work on an aircraft.

Sanding by hand or by machine can be an appropriate technique for small areas on aluminium and composite aircraft, provided that the appropriate safety equipment is worn and the right grade of sandpaper is used. Always refer to the manufacturer's maintenance manual to find out how much material is allowed to be removed.

If you are thinking about using a paint stripper to remove unwanted paint, make sure that you gather the appropriate information on the product you are using.

Firstly, reference should be made to the aircraft manufacturer's maintenance manual to establish what products can be used on that type of aircraft. The maintenance manual also stipulates where on the aircraft they can be used.

Secondly, if using a chemical stripper, confirmation should be sought that it meets the Military Specification MIL-R-81294.

Thirdly, ensure that the certifying engineer is happy with the application of the product on the aircraft, that they have stepped you through how the job is to be completed, and indicated what level of supervision is required. It is imperative that good communications are established between the certifying engineer and yourself, as maintenance mistakes are extremely costly and can be lethal.

Hydroblasting uses ultra-high pressure water to remove paint.

Chemical strippers work by penetrating the paint film, causing it to soften, swell or dissolve. Lacquers and dopes usually dissolve, while enamels, acrylic enamels, epoxies, and polyurethanes soften and swell under the attack of the stripper. Once the stripper has had time to work its magic, it's time to add a bit of elbow grease in the form of scraping.

Strippers usually contain a number of different chemicals, which is why it is important that no two types of stripper are mixed together. Some strippers are extremely toxic and can cause severe chemical burns on human skin. Not only are these strippers very hazardous to work with, but their use is prohibited in many areas of the country because of the impact on the environment.

In addition to being hazardous to your health and safety, some strippers can also be hazardous to the aircraft. Those strippers containing uninhibited acids can cause heavy etching, while those containing caustics can not only cause excessive etching but can also cause hydrogen embrittlement of metal surfaces, which can lead to stress cracking and premature metal failure.

If all this makes it sound as though paint strippers are dangerous and potentially hazardous materials to work with, then make no mistake, they are.

If sanding, or stripping and scraping your aircraft sounds too hard, yet you require a full aircraft paint and corrosion removal, then water blasting might be the answer. Hydroblasting uses ultra-high pressure water with no additives and no abrasives. It is clean, environmentally friendly and fast. The only catch with hydroblasting is that it must be performed by a trained professional. If not done correctly it can stretch the metal.

Richard Williams of Aero Technology South believes that work carried out on fabric aircraft, such as Tiger Moths or Piper Cubs, should also be performed by trained professionals, "Stripping and repainting, or repairing fabric aircraft, is such a specialised job that it is outside the scope of most pilots. The raw materials and specialised tooling make it an uneconomical proposition".

Once the aircraft has had all the paint removed, or a portion of it removed, it is time to paint. Cast a thought as to how you are going to block out or cover over windows, venturi, vents, wires, or other protrusions. When using masking tape and cutting straight edges, be mindful of 'scoring' from a knife edge, particularly around windows and stressed skin assemblies. Once finished, ensure that all masking tape is removed, especially from pitot, static, and fuel tank vents. Failure to do so has caused the collapse of wing structures on large aircraft on a number of occasions. ■

CAA Safety Videos

There will be a change to the way you order CAA Safety Videos in 2007. The existing titles will all be digitised in the New Year, with compilations made available on DVD (only). The complete list of CAA Safety Videos can be seen on the web site, www.caa.govt.nz, see "Safety information – Videos".

If you hold a New Zealand aviation document, you can borrow these from the CAA library for free. Just email info@caa.govt.nz with your client number, postal address, and the title you would like to borrow. Please return them within one week. This system will not change, apart from them being on DVD from February 2007.

If you want to purchase copies from 1 February 2007, just call 0800 GET RULES (0800-438 785), email safetyvideos@caa.govt.nz, or post your order to The Colour Guy, P O Box 30-464, Lower Hutt 5040.

In the January/February *Vector* we will be able to tell you how the titles are compiled, and the cost to purchase.

This information will also be on the web site in the New Year.

Dove Video is accepting orders up until the end of 2006, but after that date, please order from the above number.

Hand-Starting

In the July/August 2000 issue of *Vector* (page 7), in an article entitled "Hand-Swing Starting", there was a recommendation to turn off the fuel before swinging the propeller when hand-starting solo. The intention clearly was to minimise the consequences of any aircraft 'runaway'. However, we now wish to strongly advise against the practice as many aircraft will have enough fuel in the lines to taxi some distance with the fuel turned off, and there is an obvious risk of the pilot forgetting to turn the fuel back on.

It is worth repeating the reminder at the conclusion of this article, "always treat a propeller as live".

Right-of-Way at Unattended Aerodromes

Using an unattended aerodrome can be challenging, especially when they are busy and a wide range of aviation activities are taking place simultaneously. Both your airmanship and decision-making skills will be tested at times.

Before setting out for an unattended aerodrome, study the *AIP New Zealand* to find out about any local hazards such as birds, model aircraft, gliding, parachute drop operations, microlight, or NORDO activity, which may occur regularly on or near the aerodrome. Also take note of any circuit peculiarities, such as righthand circuits, whether simultaneous operations on parallel runways are permitted, or if special care is needed when carrying out a standard overhead join.

All pilots have a responsibility to avoid collisions. So, regardless of whether you have right-of-way in a situation, you must not continue if you can forsee a potential conflict arising with another aircraft.

"Even if you have right-of-way, you must not continue if you can forsee a potential conflict with another aircraft."

There are several key rules to remember when operating on, or in the vicinity of, an aerodrome. Rule 91.223 requires pilots to observe other aerodrome traffic so as to avoid a collision and either conform with the aerodrome traffic circuit formed by other aircraft, or avoid it.

There may be times when it is necessary to use a different runway from the one that is currently active. This could be the case if your aircraft requires a longer runway than the one in use, a sealed runway instead of a grass vector, or if aircraft already established in the circuit are carrying out cross-wind training.

Extreme care is required if you wish to use a runway at an unattended aerodrome that intersects another active runway. You must ensure that it will remain clear of any obstruction, (an aircraft in the circuit of an intersecting runway constitutes an obstruction) for the entire duration of the takeoff or landing. This is set out in rule 91.127, which states that no one may operate an aircraft at an aerodrome unless the runway is clear of all persons, animals, vehicles, or other obstructions during landing or takeoff (other than those essential to the operation).

Good airmanship would suggest that simultaneous use of intersecting runways should be considered only in situations where it is absolutely necessary to do so. We recommend that

Paraparaumu can be a busy uncontrolled aerodrome, particularly when glider towing is taking place.

two-way communications be established with traffic in the conflicting circuit, to confirm that both aircraft are aware of the situation, rather than just transmitting your intentions and hoping the other traffic heard and understood what you are planning to do. To proceed, you must ensure that the runway will be clear for the entire duration of your takeoff or landing. If necessary, ask the other traffic to hold downwind to make sure a conflict is avoided.

Specific right-of-way rules are given in rule 91.229. Remember these when operating at an uncontrolled aerodrome. Relevant rules are:

(f) **Landing aircraft.** Each pilot of an aircraft in flight or on the surface shall—

- (1) give way to any aircraft that is on final approach to land or is landing; and
- (2) when the aircraft is one of two or more heavier-than-air aircraft approaching an aerodrome for the purpose of landing, give way to the aircraft at the lower altitude; and
- (3) not take advantage of right-of-way under subparagraph (2) to pass in front of another aircraft, which is on final approach to land, or overtake that aircraft.

(g) **Taking-Off.** A pilot of an aircraft shall not take-off if there is an apparent risk of collision with another aircraft.

(h) **Taxiing.** Each pilot of an aircraft taxiing on the manoeuvring area of an aerodrome shall—

- (1) give way to aircraft landing, taking-off, or about to take-off;

The right-of-way rules may suggest that a landing aircraft always has right-of-way, however practical application may make this entirely dependent on the operational situation at the time. If joining aircraft leave enough space in the circuit between themselves and the aircraft landing ahead for a takeoff to be safely executed, then an efficient flow of traffic is created for the benefit of all aerodrome users.

Irrespective of rights-of-way generated by any given set of circumstances, Part 91 places a responsibility on all pilots to avoid colliding with each other. So even if you know you have right-of-way, you must not continue with a landing if you can forsee a potential conflict arising with another aircraft. ■

Senior Persons

In the last two years, the CAA's Rotary Wing Unit has received about a dozen applications for Part 119/135 Air Operator Certificates (AOCs). Some of these are from existing helicopter operators wishing to expand from, say, purely agricultural work into air transport; some are from private owners seeking a return on their investment; and others are from 'start-up' applicants.

Many of these applicants have made major financial commitments, putting themselves in a position of having to generate cash flow sooner rather than later, but have overlooked a basic requirement of the certification process – the nomination of a suitable Senior Person in terms of rule 119.101. The critical requirement is a Senior Person to be responsible for 'air operations, including the flight operations and the supporting ground operations' – and in most of these cases the Senior Person will be the Chief Pilot.

Rule 119.101(2) requires Senior Persons to hold the minimum qualifications and experience listed in Part 119 Appendix B as applicable to their function. Current requirements for the helicopter Chief Pilot are that he or she must hold at least a Commercial Pilot Licence (with instrument rating if IFR operations are proposed) and have not only 750 hours helicopter flight time but also experience *acceptable to the Director* in the type of air operation to be performed.

What then is experience, "acceptable to the Director?" In practice this is assessed by the Rotary Wing Unit, and in general, the benchmark is 500 hours in *relevant* air operations. For instance, a pilot with several thousand hours of only agricultural or deer recovery flying would not normally be acceptable for the Chief Pilot position in a passenger transport operation. This may require the operator to contract the services of a Chief Pilot from another organisation, and this is a relatively common practice, at least until the original applicant accrues enough experience in the new role to be acceptable as a Chief Pilot in their own right.

Some fundamental requirements often overlooked in the first flush of enthusiasm to obtain an AOC are found in the Civil Aviation Act 1990, notably sections 9 and 10. Section 9 *Grant or renewal of aviation document* requires that the applicant and any person 'who is to have or is likely to have control over the exercise of privileges under the document' (that is, the AOC) is a 'fit and proper person' to undertake such control; and also provides for the Director to be satisfied that granting the document 'is not contrary to the interests of aviation safety'. Section 10 sets out the actual criteria for the fit and proper person test. A major part of the fit and proper person assessment is a formal Senior Person interview with the appropriate CAA manager, and at which the CAA can not only assess the applicant's suitability, but also fully brief them on the requirements of the position.

One applicant, having been initially declined as a Senior Person, was at first aggrieved by the decision, but later, after accruing more role and management experience under the supervision of a contracted Chief Pilot, conceded that this was the best course of action – in the beginning, he literally 'didn't know what he didn't know'.

Often these applicants for an AOC are 'one-man bands', with one person intending to fill most or all roles within the company. A risk management study conducted in 2001 by the Aviation Industry Association and other industry parties identified the one-man-band syndrome as a significant factor in many of the accidents analysed. The value of the *close* supervision and mentoring by a contracted Chief Pilot cannot be over-emphasised, and may make the difference between success and failure of a fledgling operation. The CAA's Manager Rotary Wing, John Fogden, stresses that there is no substitute for experience, and this is the advice he finds himself most often passing on to AOC applicants.

Another important piece of advice to both prospective operators and the consultants who prepare AOC applications on their behalf, is to consider the personnel requirements earlier rather than later. The issue of several AOCs has been delayed at a late stage by the failure of the applicant to propose an acceptable Senior Person candidate. On occasion, the applicant has assumed that he or she would be automatically approved, but had not in fact studied the detailed requirements. Remember that the Act is the primary legislation – and lack of awareness of this has been the problem in some cases.

Further reading: GAP booklet *Chief Pilot*. ■

Organising an Aviation Event

In New Zealand there are normally around a dozen airshows ("Air Events") every year. Some of these are repetitive events, such as Warbirds Over Wanaka, or Classic Fighters at Omaka. The organisers of these events have done it all before, and are aware of the difficulties of organising a safe and crowd-pleasing event. This article is designed to assist first-time organisers of new events by providing information, tips and traps that others have learnt in organising air displays. It can also be used as a useful reminder of things to consider by individuals or organisations that have previous experience in running shows.

This article only covers the air side of such an event. It does not discuss all the myriad of other details that must be attended to, such as parking, vehicle access, toilets, catering, publicity, and so on. Experienced event organisers will tell you that these aspects of organisation invariably take up much more time than most people think, and are a much more daunting task than the (relatively) simple task of running the air event. You should also be aware of any local body requirements, as well as the increasing interest of other agencies (eg, Police, and OSH) in such events. In particular, such agencies will be very interested in your Emergency Plan in the event something goes amiss.

The Rules

Aviation Events, Air Shows, and Aerobatic flights are all covered in CAR 91.703 and AC 91-1. Ensure that you have read and completely understand all the information contained in the Rule and the AC.

Note that for any Aviation Event that requires the approval of the Director, a minimum of 90 days notice is required. The application form (CAA 24091/03) is available on the CAA web site, www.caa.govt.nz. An event approval is required for any event where more than three aircraft are involved (unless in a single formation), or where more than 500 people are spectators. If in doubt, ask!

It is strongly advised that you contact the CAA for advice before you begin detailed planning for your event. The best contacts will be your local Field Safety Adviser (see page 22), or the GA Group – see the CAA web site for contact details.

Airspace

For any display other than a low-key event at a quiet locality, it is strongly advised that the organisers put in place some form of airspace restriction. This will enable the organisers to control who flies in the airspace during the event.

If the event is being held at an aerodrome with Air Traffic Control (ATC), it will probably not be necessary to establish restricted airspace, unless the event is a major one with a significant affect on normal air traffic. With the agreement of the airfield operator and Airways Corporation, the Control Zone (or portions of it) can be promulgated as a Restricted Area for specified times to allow for the airshow and any practice periods. Note that 90 days notice is required for promulgation of a Restricted Area, which would normally be by way of an *AIP Supplement*.

If the event involves aerobatics or high-performance aircraft it may also be necessary to include part of the CTA above the airfield within any restricted area promulgated, and this will require consultation with the affected ATC unit.

If the event is to be staged at an uncontrolled venue, the process is basically the same, except that there will now be a requirement to specify the area to be protected. This is often done by defining a circle of a three or five nautical mile radius around the airfield or venue, up to an appropriate altitude. Again, promulgating the restricted airspace will require the approval of the airfield operator or venue owner, and the CAA will want to see evidence of consultation before designating the Restricted Area.

Even if the event does not require restricted airspace, it is strongly advised that the organisers arrange for publication of an *AIP Supplement*. This requires a minimum of 90 days notice, and there are reminders of the cut-off dates in every issue of *Vector* (see page 21). It is inappropriate to use a NOTAM for pre-planned events such as these. A NOTAM should only be used for situations of an urgent and temporary nature, such as an unforeseen aerodrome closure or significant hazard.

Display and Crowd Lines

The requirements for display lines are well documented in the Rule and AC. At most venues, there is often little choice in where the display line and area will be. This will be dictated by factors such as airfield layout, surrounding terrain, crowd areas and visitor car parking. If there is a choice about the display line, then the following issues should be considered.

Sun – It is always preferable for the display line to be to the south of the crowd, so that spectators are not looking into the sun to watch display aircraft.

Wind – Similarly, it is always preferable to have the wind blowing along the crowd line (best), or away from the crowd (okay), but *not* towards the crowd. A wind towards the crowd has the double disadvantage of the spectators looking into wind, and also it tends to blow display aircraft towards the crowd line, which is never a good thing.

Angled display line – Where possible it is nice if the display line has a bend in the middle, towards the crowd. This will enable display aircraft to do a curved flypast, banked towards the crowd, without infringing the display line.

Pilot Qualifications and Practice

Event organisers must ensure that display pilots are appropriately licensed, rated, qualified, insured, and in current practice for the event they will undertake. It should be an absolute condition of the display that the organisers sight all relevant documentation from the pilots. Failure to do so could jeopardise things like event insurance. Invariably, someone will turn up to the event having forgotten to bring some required documentation. This puts the organiser in a compromised position. The rule must be, 'no documents, no fly'.

The organisers should also insist on observing a practice of the proposed routine from each display act. Once a display has been observed and approved, it must not be changed without the consent of the organisers.

Safety – Spectator Control

One of the biggest dangers at air events is the mixture of aircraft and spectators. The author of this article has vivid memories of watching a small child run through the propeller arc of a taxiing aircraft at an airshow. How the propeller missed the child will never be known, but it gave a huge fright to all concerned (except the child, who ran on to mother unaware of his brush with death). This incident was caused by a combination of inadequate spectator control, coupled with lack of provision for aircraft refuelling clear of the spectator area.

An absolute requirement is that there should be no spectator access to any area where aircraft are operating. Secure fencing (not a rope barrier) and marshals should always be between any spectators and any running aircraft.

Provision must be made for aircraft refuelling during an airshow. This will either be through the use of fixed pumps, or a mobile tanker. If fixed pumps are used, then either there must be controlled and secure taxi access to the pumps, or aircraft should be shut down in a clear area and towed to the pumps. Under no circumstances should aircraft taxi to pumps that are not secure from public access.

If at all possible it is recommended that event organisers arrange for a mobile tanker for airshow refuelling. It minimises aircraft ground movements, and generally enhances aircraft security and spectator safety.

Briefings

An essential element for a good event is a comprehensive briefing that all participants (flight and ground) MUST attend. The briefing should at least cover:

- the event programme
- procedures
- communications.

Always provide a written copy of the brief – it reduces the number of times you have to answer the same question because someone wasn't listening the first time!

Hints for a Better Show

Variety is the spice of life – the same goes for air events. Provide a mixture of activities. Where you have two similar aircraft types doing similar routines, then separate them in the programme, putting different aircraft in between.

Communications, both air-ground, and ground to ground, are almost invariably problems. Don't rely on cellphones, or on hand-held radios – they always run out of power just when you need them most.

Run a dress rehearsal of the ground side of the event – you will be surprised how many things you didn't think about.

Avoid giving organisational jobs, particularly on the day of the event, to anyone flying in the show. The last thing a display pilot needs is to be worrying about anything other than flying.

Depending on the size of the event, it is a good idea to nominate a suitably experienced person to act as your Safety Officer. This person should have no other tasks to perform, and has a mandate to keep an eye on all facets of the event organisation and conduct. ■

Special Category Aircraft

New Zealand has a rapidly growing fleet of warbird and microlight aircraft. The operators of these aircraft naturally want to be able to participate in training, air shows, sport activities, and (in the future) 'Adventure Aviation' activities.

One common factor concerning these aircraft is that they do not qualify for a standard or restricted category airworthiness certificate. For the past 11 years these aircraft have been placed in the only special category available, "Experimental".

The Part 21 Special Category Aircraft Rule Project was initiated in order to recognise these aircraft for what they are, and how they are operated. The Notice of Proposed Rule Making (NPRM) for these changes was published in October 2006, and submissions close 8 December 2006.

The rule changes propose to expand the Special category with the following sub-categories.

Experimental

This category would be used only for research and development, showing compliance with the rules, and flight evaluation.

The TL-2000 Sting is accepted as an S-LSA in the United States.

Exhibition

The Exhibition category will cater for those aircraft that are primarily used for airshows, aerobatic competitions, or the film industry. These aircraft may be factory-built but will not be type-certificated. Single-seat warbirds, replica aircraft, and one-off unlimited aerobatic designs will be eligible for this category.

The owner/operator of this Fokker Triplane replica aircraft could apply for an airworthiness certificate in either the Exhibition or Amateur-built categories depending on their requirements.

Amateur-built

Aircraft will fit this category once they have completed the initial flight evaluation process under "Experimental". If, however, the aircraft is modified at a later date, it may be required to go back into the Experimental category for further flight evaluation until the modification has been proven.

Primary

The primary certification standard originates in the United States. Unusually, it is type-certificated, but issued with a special category airworthiness certificate. There are no aircraft designed to the primary category registered in New Zealand at this time, but this enables the type to be considered for import in the future.

If factory-built, an aircraft in the Primary category may be operated for limited hire or reward.

Light Sport Aircraft (LSA)

The Light Sport Aircraft category is taking the world by storm following its acceptance in the US. Basically, it equates to aircraft types we have been using for years as advanced microlights. Factory-built LSA aircraft are designated S-LSA, and kit-built LSA aircraft are designated as E-LSA. A factory-built aircraft in the LSA category may be operated for limited hire or reward.

Limited

Aircraft eligible for the Limited sub-category will be ex-military and vintage aircraft produced in a series and factory-built in a controlled environment. These aircraft will not be type-certificated. They will normally be multi-seat aircraft used for private operations, or the proposed Adventure Aviation type of operation. As passengers may be carried, the rule seeks to mitigate risk by limiting the numbers of passengers in both aeroplanes and helicopters, issuing operations specifications to the operator, and ensuring that maintenance is controlled by a named principal maintenance provider. Provision is made in the rule for Limited category aircraft to be eligible for certain hire or reward operations.

The Curtis Kittyhawk (title photo left), and this De Havilland Fox Moth, could be issued with airworthiness certificates in the Limited category to enable them to carry paying passengers under proposed Adventure Aviation operator certification.

The Special Category Aircraft Rule Project provides a platform to enable certain aircraft without type certificates to engage in some hire or reward activities under the proposed Adventure Aviation Rule Project, which is now in the Technical Development stage prior to production of an NPRM. This has been the wish of many of the ex-military aircraft owners for the past 10 years, and can now become reality, with appropriate checks and controls.

Consequential amendments are proposed to Part 1 *Definitions and Abbreviations*, Part 43 *General Maintenance Rules*, Part 66 *Aircraft Maintenance Personnel Licensing*, and Part 91 *General Operating and Flight Rules*.

This is only a summary of the significant rule changes that affect the owner/operator. For full details of the proposals, check the CAA web site, www.caa.govt.nz, see "Rules & more – Notices of Proposed Rule Making (NPRMs) Open for Submissions". Further information about NPRMs, and how you can participate, is in the booklet *The Rule Development Process*. Copies can be obtained from your CAA Field Safety Adviser, or email: info@caa.govt.nz. ■

This Vans RV 7A is an amateur-built aircraft. The initial flight evaluation period for these aircraft will be carried out under the Experimental category, and then they will be issued an airworthiness certificate in the Special Category – Amateur-built.

Part 135 Pilot Experience Levels

Civil Aviation Rules, Part 135 *Air Operations – Helicopters and Small Aeroplanes*, gives the operating requirements for a diverse range of activities, from flights under Visual Flight Rules (VFR) through to multi-engine single-pilot Instrument Flight Rules (IFR) operations.

The only minimum flight hours currently specified in Part 135 for pilot-in-command VFR or IFR experience requirements (above the minimum required for a Commercial Pilot Licence or Instrument Rating), are those in rule 135.505. These specify the consolidation flight time required on different makes and models of aircraft.

An analysis of CAA accident data, overseas regulatory comparisons, and International Civil Aviation Organisation (ICAO) recommendations, have highlighted the need to review the current flight experience requirements for Part 135 pilots.

After technical discussions with the aviation community, a Notice of Proposed Rule Making (NPRM) has been issued for public consultation, detailing amendments to Part 135, and associated changes to Parts 61 and 119.

The proposed amendments would raise the minimum flight time experience for pilots conducting air operations under IFR and clarify the requirements for consolidation flight time on different makes and models of aircraft. They would also provide a graduated scale for Part 135 pilot experience requirements according to the complexity of the operation.

Consequential amendments include raising the experience levels for the senior person responsible for air operations within a Part 135 organisation, and changing Part 61 to allow both pilots to log flight time during consolidation flights conducted in single-pilot certified aircraft.

The NPRM is available on the CAA web site, www.caa.govt.nz, under "Rules & more". Submissions close on 1 December 2006 and should be forwarded to the Docket Clerk, email: docket@caa.govt.nz.

Changes to Your Phone or Email?

We understand that Telecom 025 mobile phone numbers are being phased out, so it is timely to remind you to update any of your contact details if they have changed, such as mobile phone numbers and email. It's easy – just email info@caa.govt.nz.

This is a further article in the series that takes an in-depth look at recent aircraft accidents in New Zealand. The aim is to amplify the safety messages that can be derived from the accident. The official accident report or brief can be found on the CAA web site at www.caa.govt.nz.

Cessna 182R ZK-FGS (Occurrence No 05/2471)

FGS crashed in the sea off the Waipara River mouth (North Canterbury) killing the pilot-owner and his wife. The accident report concluded that the pilot had flown into an area of poor weather, and that *"during a climbing turn in an area where poor horizon and surface definition probably existed, the pilot lost control of the aircraft, probably whilst spatially disorientated, at an altitude lower than that required to permit a successful recovery."*

This is not the first time, and unfortunately probably not the last time, that an accident has occurred because the pilot chose to fly on in marginal and worsening weather conditions.

The pilot and his wife were on the final leg of a multi-day VFR trip around New Zealand in their aircraft. They were flying from Nelson to their home airstrip near Christchurch when the accident occurred. The actual time and location of the crash, and the route of flight and altitude, were found from information recovered from the GPS used by the pilot. The GPS, along with various other pieces of wreckage, and the bodies of the two occupants, washed ashore some time after the accident. The aircraft itself was never found.

This accident highlights a number of factors common in many aircraft accidents, including weather awareness, in-flight decision making, diversion options, flight following, and 'get-home-itis'.

Weather

The pilot had obtained a weather briefing for the flight at Nelson, using the IFIS system, several hours before departure. Crucially, he did not obtain Area Forecasts (ARFORs) for the planned route, only the TAFs, METARs and SPECIs. The Christchurch TAF indicated the presence of an on-shore flow on the Canterbury coast, with low cloud forecast. The TAF, however, is specific to the aerodrome. The Plains (Canterbury) ARFOR was forecasting visibility reducing to 2500 metres in rain and drizzle, and to 400 metres in fog. Forecast cloud was broken stratus at 300 feet (amsl) with rain and drizzle, otherwise broken cumulus and stratocumulus cloud between 1200 and 8000 feet. Had the pilot requested the ARFORs, it would have been clear to him that the conditions would deteriorate as he progressed toward Christchurch.

The pilot did not request an update on the weather information from Air Traffic Services. An amended TAF was issued while the flight was proceeding, indicating that the weather at Christchurch was even worse than originally forecast. This amended TAF would have been available to the pilot on request to ATS. Note that pilots do NOT have to file a flight plan to ask ATS for weather information while en route (see the note below). Also note that Information transmits a "HAZMET" broadcast every hour, with updates on aerodromes where the weather may be a problem. Pilots should listen in to this broadcast to decide if they need to get the weather update for their intended flight. Listening out on the Information frequency can also alert you to weather problems reported by other pilots in the area.

In-Flight Decision-Making and Diversion Options

The pilot left the decision to turn back or divert until too late. He had quite deliberately descended to fly below 500 feet in an effort to get under the cloud. Even without the benefit of hindsight, these are poor decisions. One of the fundamentals of airmanship is to always give yourself options, and always have an escape route.

In this accident, the pilot's decision-making may have been affected by his perception of the fuel state of his aircraft. The accident investigator calculated that, almost up to the time of the accident, the pilot could have diverted to Kaikoura for fuel, but it would have been 'tight'. Note that the pilot had not refuelled at Nelson, and the aircraft had last been refuelled at Wanganui. By failing to top up the tanks at Nelson the pilot had already started to limit his options for diversion.

See also Occurrence 99/3174 on the CAA web site under "Safety Information – Accidents and Incidents – Fatal Accident Reports" for a very similar fuel scenario, which resulted in an accident not very far from the one discussed here. There was a free lesson there for the taking.

Flight Following

The pilot had not filed a flight plan, nor did he have to. The aircraft was actually reported missing the day after the crash by a neighbour who realised the aircraft had not arrived as expected. In this case, it wouldn't have made a lot of difference – the accident was not survivable. Imagine for a moment that they had survived the crash, maybe floating out at sea, or washed up on an isolated beach. What would the chances of survival be in those circumstances if no one was looking for you? If you decide not to file a flight plan, then at least make sure that some responsible person is aware of your plans, expected arrival time, and what to do and who to inform if you don't turn up on time.

Get-home-itis

How many accidents have occurred on the homewards leg of a flight? We will never know if get-home-itis was a factor in this accident. Would an extra night in Nelson or maybe Blenheim have been a problem? Remember the old saying, "Better late than dead on time."

Summary

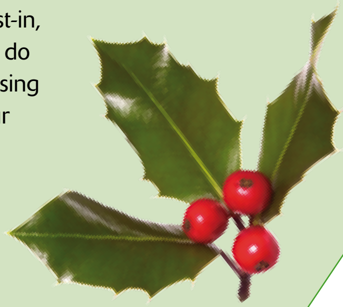
- Always obtain a full weather briefing, including ARFORs and TAFs, for your flight.
- Update the weather information en route, particularly if it might be a problem.
- Give yourself options for diversion at all times.
- Do not press on into bad weather.
- Carrying extra fuel (without overloading the aircraft) gives you more options.
- Ensure that someone knows where you are, your plans and ETA, and what to do if you don't turn up – even better, file a flight plan.
- Do not succumb to insidious pressures such as 'get-home-it is'.

En-Route Weather – ATS will provide weather updates for pilots en-route, but there is an expectation that pilots will have already obtained forecasts prior to flight, unless there is a very good reason why this could not be done. ■

Reminder from Licensing

If you are applying for the issue or amendment of CAA Licences, please get your applications in early if you require your licence before the Christmas/New Year holidays. This is a very busy time for personnel licensing and everyone considers their own applications urgent.

They are dealt with on a first-in, first-processed basis. Please do not call the Personnel Licensing Unit – this will not give your application greater priority, and it only takes staff away from the important job of issuing the many licence applications.



AMEL Syllabus

Part 66 – Aircraft Maintenance Engineer Licence (AMEL) Syllabus Review Update

During the last five years there has been considerable effort put into drafting new AMEL syllabuses. The Technical Study Group (TSG) for the syllabus development completed most of the new drafts at the end of 2003, but there was still a need to complete the avionic syllabuses, and review all against the ICAO and European Aviation Safety Authority (EASA) Part 66 requirements. This work has now been completed and the syllabuses are available for final review by the industry.

A key aspect of the recent review was to align the syllabuses as closely as possible to the EASA Part 66 standard without dramatically changing the New Zealand licensing structure. One of the reasons for this is that Australia and many Asian countries are moving towards the EASA Part 66 model.

The major changes to the syllabus subjects are:

- The splitting of Subject 001 – Aeronautical Science into two separate subjects (below) of a manageable size for learning and examination, and to align more closely with EASA.
  - Subject 001A – Aeronautical Science – Mathematics and Physics. This will cover all the mathematics and physics required by an AME.
  - Subject 001B – Aeronautical Science – Electrical Fundamentals. This will contain all the electrical material from the original Subject 1 – Aeronautical Science and Subject 11 – Avionics I.
- Introduction of Subject 012 – Avionics II for Avionic Engineers, on aircraft over 5700 kg.
- Major review of avionics subjects for aircraft over 5700 kg: 013 – Electrical Systems, 014 – Instrument Systems, and 015 – Radio Systems.
- Alignment of subject knowledge levels with EASA requirements.
- Rationalisation of ICAO requirements relevant to the New Zealand aviation environment.

These changes are designed to assist engineers to cover the extent of knowledge now required under the ICAO and EASA licensing requirements. The review also now shows how the New Zealand system aligns with the EASA system. This will assume much more importance in the future, particularly for recognition of the New Zealand AMEL.

The new Draft Syllabus and more detailed information on the review are available on the CAA web site (under "Maintenance Engineers") for comment.

The CAA is considering running some seminars on the changes. If you would be interested in attending, or if you require further information on the draft syllabus, please refer to the CAA web site, or contact Mark Price, AME Examiner:

Email: pricem@caa.govt.nz

Tel: 0–4–560 9619

Fax: 0–4–569 2024

Advanced Avionics Diploma

Nelson Marlborough Institute of Technology (NMIT)

This programme provides the level of training required for existing licensed aircraft maintenance engineers wanting to gain specialist qualifications in Advanced Avionics. There are four six-week courses planned, two to be run in 2007 and two in 2008. Students who complete all four courses will receive the NMIT Diploma in Advanced Avionics Maintenance (Level 6). The courses are: Advanced Avionics Theory (012), Electrical Systems (013), Instrument Systems (014) and Radio/Radar Systems (015).

The first six-week course is Advanced Avionics Theory (Avionics II, CAA subject 012) and begins on 30 April 2007. For further enquiries, Tel: 0800 422 733, or Email: aviation@nmit.ac.nz.

New Chairman

Rick Bettle has been appointed as chairman of the Civil Aviation Authority.

Mr Bettle took over from outgoing chairman Ron Tannock in October.

An Accredited Fellow and current President of the New Zealand Institute of Directors, Mr Bettle is well respected for his governance expertise in both the public and private sectors.

Mr Bettle chaired the New Zealand TAB for eight years, and is a former chairman of Capital Coast Health. He has chaired New Zealand Lamb and Wrightson Finance, and was the Chief Executive Officer of Alliance Group from 1991 to 1995.

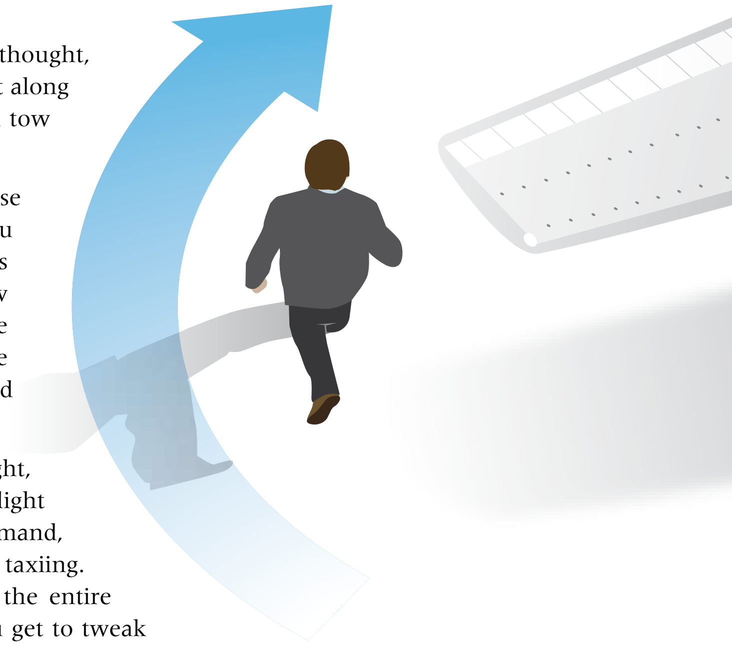
He is current chairman of Dominion Finance, and of the Aviation Tourism and Travel Training Organisation (ATTTO). He holds directorships of Southport, Macquarie Goodman NZ, Revera, and Synergy International.

In announcing the appointment, Minister of Transport Annette King said the CAA would benefit from Mr Bettle's broad range of experience in diverse economic sectors.

Mr Bettle is Wellington-based, and intends to meet with various members of the aviation industry as opportunities arise.

"I am interested to talk to the CAA's key stakeholders, including industry, and I will listen," Mr Bettle said.

'Walk-Around'



Have you ever started taxiing your aircraft and had a horrible thought, "did I put the fuel caps on?" I am sure that we have all had a thought along these lines. Many an aircraft has taken off with a pole stand in, or a tow hook still attached.

By getting into the habit of doing a walk-around you can rule these thoughts out of your mind. A 'walk-around' is exactly that. Once you have loaded all your passengers on board, you simply walk 360 degrees around the aircraft looking for obvious omissions. For example, tow hooks and rudder control locks have been removed, fuel caps have been tightened, doors are shut and latched, chocks and steps are removed, pole stands are out, and everything external appears stowed and ready to fly.

We recommend that a walk-around be conducted before every flight, however, this practice isn't intended to override a thorough preflight inspection. The walk-around should be completed by the pilot-in-command, or first officer of the aircraft, just before starting up the aircraft for taxiing. If you are working as a flying instructor, and you do not witness the entire preflight inspection, a walk-around will be the final chance that you get to tweak fuel caps and engine cowling clips, to confirm that they are secure for flight.

Adventure Aviation Scope Statement

The Part 115 Scope Statement has been revised and re-issued as Version 1.1. The revisions include an amendment to the introductory statement, the addition of a further organisation, and corrections to contact phone numbers. You can access the revised scope statement on the CAA web site under "Rules & more – Rule Project Scope Statements".

Clarification

In the September/October 2006 issue of *Vector*, in the article "Adventure Aviation", we stated that:

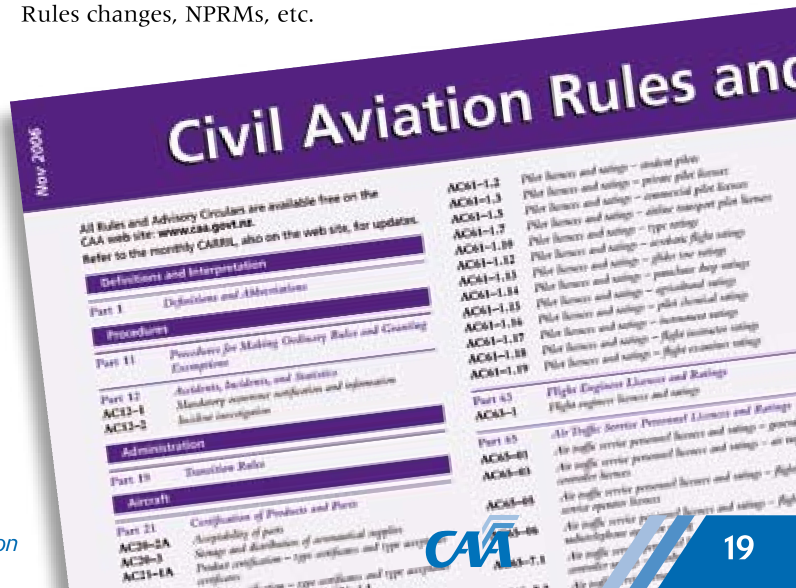
> *There are several problems with the current regulatory system. In particular, there is no mechanism for the Director to certificate individual operators. At present hang glider, paraglider, balloon, and skydiving companies are not required to hold an aviation document in order to operate.*

Anyone familiar with the topic will understand that we are referring to organisations. Some confusion has been expressed, however, so we would just like to clarify that we were talking about the inability to certificate organisations (just like Part 119/135, etc). The individual people do, of course, require a CAA licence or a certificate issued by a Part 149 organisation under delegation by the Director of Civil Aviation.

Rules Poster Update

Enclosed in this issue of *Vector* is an updated Current Rules and Advisory Circulars poster. The most up-to-date information on Rules will always be on the CAA web site, www.caa.govt.nz, but this poster is useful to have on the office or briefing room wall. Make sure you replace old versions with this updated one – the colour is different to make updating easier.

On the web site you can find all current Rules, Advisory Circulars, and NPRMs. The most useful publication for regularly updated information on the Rules is the CARRIL (Civil Aviation Rules Register Information Leaflet). It is published on the web site monthly, generally on the first Thursday of every month, with special editions when required. You can subscribe to our email notification service to be advised when the CARRIL is published. On the "Rules & more" page, see "FREE Notification Service". This service can also be used to receive updates on Rules changes, NPRMs, etc.



GA Passenger Briefing

A professional passenger briefing is an important part of a flight – but it is easily overlooked. It sets the tone for your flight, and can help put your passengers at ease.

The way a briefing is delivered is as important as the content covered in it. Try to avoid technical language, instead explain things simply. Keep your briefing light and friendly – you don't want your passengers embarking on their journey with a sense of impending doom. At the same time it also needs to be professional. In the event of an emergency, your passengers will respond instantly to a professional pilot who gives assertive, clear and specific instructions.

You will be giving your passengers a great deal of important information in a short space of time. If you keep it concise, this will aid their recall of important safety instructions. If your passengers' first language is not English, try to use body language to demonstrate your briefing visually (as you speak), and keep an eye out for signs that your passengers do not understand your instructions, such as frowning, frustration, or loss of attention.

Depending on your type of operation, it can be a good idea to start your briefing before taking passengers onto the active apron area (particularly for helicopter operations). If possible, do this inside – away from the sight and sound distractions of the busy apron. Explain that the apron can be a dangerous place and they must remain with you, or at a point designated by you, at all times. Warn them to remain clear of propellers and rotor blades, and explain where to approach the aircraft from. Ask them not to chase any items dropped or blown away. If practical, you will retrieve them.

Passengers are required to be briefed on the use of portable electronic devices (PEDs) and where smoking is permitted. It is a good idea to cover these now, pointing out that smoking is not acceptable on the apron or in the aircraft. Go over the rules concerning PEDs if your flight is to be conducted under Instrument Flight Rules. You can find these in rule 91.7. Advise them that cellphones should not be used near fuel pumps.

There is not much room to demonstrate life jackets in a GA cockpit. Consider doing this before going to the aircraft.

Once everyone is inside a GA aircraft, there is not much room. Passengers sitting directly behind the pilot may find it hard to see you, so consider demonstrating the use of life jackets (if you are required to carry them) at the end of your apron safety brief, before going to the aircraft.

When helping your passengers into their seats, show them how to use their seat belts, and explain when they must be worn. If the seats are adjustable, explain how to position them and what configuration they must be in for takeoff and landing. If tray tables are fitted, these must be stowed for taxi, takeoff and landing.

Cover how to open and close doors and emergency exits. If your passengers are wearing headsets, ask them not to speak when you are talking on the radio, and make front-seat passengers aware of the need to remain clear of the controls. To enhance passenger comfort, explain the weather conditions you expect en route, and warn them if turbulence is possible. Show them how to adjust the air vents on board and where to find sick bags.

Several example briefings are shown on the "Safety Around Helicopters" DVD.

Brief passengers on the location and use of survival and emergency equipment (such as first-aid kits, fire extinguishers, axes, and ELTs), life jackets and life rafts, and oxygen equipment, when Part 91 requires these to be carried.

Go over the procedures in the event of an emergency. This could be as simple as saying, "In the unlikely event of an emergency, please follow my instructions."

Rule 91.211 requires a passenger briefing to include a statement that Civil Aviation Rules require passenger compliance with lighted signs and crew member instructions. It also states that a briefing is not required if the pilot-in-command determines that all passengers are familiar with the contents of the briefing.

Even if your passengers are familiar with the aircraft type, every registration has subtle differences in the location of emergency equipment. It would still pay to point out the location of the axe, fire extinguisher, first-aid kit, and life jackets.

Passenger briefing cards showing the location and use of emergency exits and emergency equipment can be used to supplement a briefing, but they cannot replace it. The cards must be located so that all passengers can access them, and they must contain only information specific to the type and model of aircraft they are carried on.

Another useful supplement to a helicopter briefing is the *Safety Around Helicopters* DVD. The Introduction module is designed to be viewed by all passengers. It gives information on safely approaching a helicopter, and using the doors and seatbelts. The DVD is then split into modules for different types of operations. Pilots will find the Corporate & Tourism module useful for tips on giving a passenger briefing, as several example briefings are shown. The DVD can be borrowed from the CAA library for free by emailing info@caa.govt.nz, and purchased from Video New Zealand, email mike@videonz.co.nz. ■

PILOT EXPO
General Aviation Exhibition

Ardmore Aerodrome
2 and 3 December 2006

POSTPONED

We have just heard that this event, mentioned in the previous *Vector*, has been postponed. Keep an eye on the Pilot Expo web site, www.pilotexpo.co.nz, for further information.

How to get Aviation Publications

Rules, Advisory Circulars (ACs), Airworthiness Directives

All these are available for free from the CAA web site, www.caa.govt.nz. Printed copies can be purchased from 0800 GET RULES (0800 438 785).

AIP New Zealand

AIP New Zealand Vols 1 to 4 are 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).

Planning an Aviation Event?

Do you have an event such as an airshow, air race, rally or major competition coming up soon? If so, you need to have the details published in an *AIP Supplement* to warn pilots of the activity in a timely manner. The information should be submitted to the CAA with adequate notice. (Refer to AC 91–1 *Aviation Events*.)

Please send the relevant details to the CAA (ATS Approvals Officer or AIP Editor) **at least** one week before the appropriate cut-off date indicated below.

Supplement Cycle	*Supplement Cut-off Date (with graphic)*	*Supplement Cut-off Date (text only)*	*Supplement Effective Date*
07/2	23 Nov 2006	30 Nov 2006	15 Feb 2007
07/3	4 Jan 2007	11 Jan 2007	15 Mar 2007
07/4	1 Feb 2007	8 Feb 2007	12 Apr 2007
07/5	1 Mar 2007	8 Mar 2007	10 May 2007

Young Eagles News

Scholarships

In 2007, five Ross Macpherson Memorial Flying Scholarships and one Around New Zealand Air Race Scholarship will be awarded, worth $2000 each. The scholarships are open to all those enrolled as Flying NZ Young Eagles who are at least 15 years old and capable of obtaining a Class 2 Medical Certificate.

Each Flying NZ affiliated aero club may enter two candidates, who are required to write an essay of 500 words or less giving their reasons for wanting to learn to fly. Applications must also be accompanied by proof of the Young Eagles activities the candidate has taken part in, and a summary of additional aero club activities or other aviation related activities the candidate has been involved in. The sponsoring aero club must also provide a report on the Young Eagles activities they have organised in the last year, and the activities they are planning for the next six months. Entries close on 31 December 2006.

"Flying NZ" is the marketing brand of the Royal New Zealand Aero Club (RNZAC).

South Canterbury Young Eagles

Recently, the South Canterbury Aero Club's Young Eagles were flown by club pilots to two North Canterbury airstrips.

Their first stop was Forest Field aerodrome. Here they were welcomed by Pam Collings. Pam competed in the World Aerobatic Championships in the 1970s. The Young Eagles viewed an exciting video of an aerobatics display Pam flew in the Mt Cook area – giving them an insight into the world of aerobatics.

Following this, the group went on a tour of the private hangars situated on the airfield. Highlights of the hangar tour included Austers and a North American Harvard trainer once used by the South African Air Force. Andy Little, one of the Harvard's owners, gave the group a rundown on the aircraft.

South Canterbury Young Eagles in front of the Titan P51 Mustang. (Left to Right) John Evans, Andrew Stewart, Billy Smith, Nicola Bird, Hannah Bird, Jesse Smith, and Matthew McTague (seated in aircraft).

The group then flew on to Loburn Abbey, where Ivan and Sandy Campbell are busy building scale replicas of classic aircraft, including the Titan P51 Mustang, the Spitfire, and the Tiger Moth. Not only was the group able to examine an aircraft in an advanced stage of construction, but also they were invited to sit in the cockpit of a completed Mustang fighter replica.

On the return flight to Timaru, an opportunity was taken to overfly the old Te Pirita airfield. This was built during World War 2 for use by the United States B-17 bombers, in order to stem a possible invasion by Japanese forces.

The generosity of South Canterbury Aero Club pilots made this trip possible. The pilots were rewarded with appreciative comments from the Young Eagles once they were back on the ground at Timaru. ■

Field Safety Advisers

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Accident Notification

24-hour 7-day toll-free telephone

0508 ACCIDENT
(0508 222 433)

The Civil Aviation Act (1990) requires notification "as soon as practicable".

Aviation Safety & Security Concerns

Available office hours (voicemail after hours).

0508 4 SAFETY
(0508 472 338)

info@caa.govt.nz

For all aviation-related safety and security concerns

OCCURRENCE BRIEFS

LESSONS FOR SAFER AVIATION

The content of *Occurrence Briefs* comprises notified aircraft accidents, GA defect incidents, and sometimes selected foreign occurrences, which we believe will most benefit operators and engineers. Individual accident briefs, and GA defect incidents are available on CAA's web site **www.caa.govt.nz**. Accident briefs on the web comprise those for accidents that have been investigated since 1 January 1996 and have been published in *Occurrence Briefs*, plus any that have been recently released on the web but not yet published. Defects on the web comprise most of those that have been investigated since 1 January 2002, including all that have been published in *Occurrence Briefs*.

ACCIDENTS

The pilot-in-command of an aircraft involved in an accident is required by the Civil Aviation Act to notify the Civil Aviation Authority "as soon as practicable", unless prevented by injury, in which case responsibility falls on the aircraft operator. The CAA has a dedicated telephone number 0508 ACCIDENT (0508 222 433) for this purpose. Follow-up details of accidents should normally be submitted on Form CA005 to the CAA Safety Investigation Unit.

Some accidents are investigated by the Transport Accident Investigation Commission (TAIC), and it is the CAA's responsibility to notify TAIC of all accidents. The reports that follow are the results of either CAA or TAIC investigations. Full TAIC accident reports are available on the TAIC web site, **www.taic.org.nz**.

ZK-UAC, Pacific Aerospace 750XL, 27 Dec 03 at 06:01, 341 nm SSW San Francisco. 1 POB, injuries 1 fatal, aircraft missing. Nature of flight, ferry/positioning. Pilot CAA licence ATPL (Aeroplane), age 58 yrs, flying hours 16,564 total, 180 on type.

The pilot was ferrying the aircraft from Hamilton, New Zealand to Davis, California, via Pago Pago, American Samoa; Christmas Island, Kiribati; and Hilo, Hawaii. On the final leg, following a position report 858 nm from San Francisco, he reported a problem with his fuel system, indicating a probable ditching. Under the observation of a US Coast Guard HC-130 crew, the pilot ditched the aircraft at 1701 UTC, 341 nm from San Francisco, the aircraft nosing over on to its back as it touched down. The pilot did not emerge as expected and was later found by rescue swimmers, deceased, still in the cockpit. His body could not be recovered and was lost with the aircraft. A full accident report is available on the CAA web site.

Main sources of information: CAA field investigation.

CAA Occurrence Ref 03/3794

ZK-PLG, Alpi Aviation Pioneer 300, 19 Mar 04 at 18:30, Pukeatua. POB 1, injuries nil, damage substantial. Nature of flight, private other. Pilot CAA licence nil, flying hours 460 total, 112 on type, 20 in last 90 days.

The microlight experienced a loss of power on final approach into a private strip. The aircraft made a forced landing in a field and impacted a fence, causing substantial damage. It is suspected that the aircraft suffered fuel starvation.

Main sources of information: Accident details submitted by pilot.

CAA Occurrence Ref 04/1047

ZK-HMP, Hughes 269C, 12 May 04 at 15:15, Waingawa River. POB 2, injuries nil, damage substantial. Nature of flight, training dual. Pilot CAA licence CPL (Helicopter), age 40 yrs, flying hours 2600 total, 1980 on type, 144 in last 90 days.

During autorotation training, the pilot recovered late, and the aircraft struck the river bed, causing damage to the tail rotor and tail boom.

Main sources of information: Accident details submitted by pilot and operator.

CAA Occurrence Ref 04/1567

ZK-JPP, Pacific Aerospace 750XL, 4 Jul 04 at 21:15, Switzerland. POB 14, injuries nil, damage minor. Nature of flight, parachuting. Pilot CAA licence PPL (Aeroplane), age 41 yrs, flying hours 6700 total, 15 on type, 60 in last 90 days.

Fourteen skydivers were completing a jump in three groups. The first group departed successfully. During the second group's departure, one skydiver struck the aircraft tailplane. He was uninjured, but the aircraft received damage to the tailplane area.

Main sources of information: Accident details submitted by pilot and operator.

CAA Occurrence Ref 04/2143

ZK-GKK, Glasflugel Mosquito, 27 Oct 04 at 18:30, Hawera. POB 1, injuries nil, damage substantial. Nature of flight, towing. Pilot CAA licence PPL (Aeroplane), age 58 yrs, flying hours 206 total, 4 on type, 6 in last 90 days.

The glider was being towed during takeoff at Hawera.

Continued over...

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At approximately 250 feet, the tow rope released from the tow plane. The glider pilot made a 180-degree turn back onto Runway 07. The glider's right wing struck the ground, resulting in the fuselage breaking in two.

Main sources of information: Accident details submitted by pilot.

CAA Occurrence Ref 04/3490

ZK-RDP, M Gillespie Helithruster, 1 Nov 04 at 09:21, Feilding. POB 1, injuries minor, damage substantial. Nature of flight, test. Pilot CAA licence nil, flying hours 1300 total, 23 on type, 15 in last 90 days.

It was reported that the aircraft was experiencing a vibration during the downwind leg of the circuit. The vibration worsened during final approach. A rough landing was then carried out to avoid the aircraft hitting a fence.

Main sources of information: Accident details submitted by pilot.

CAA Occurrence Ref 04/3477

ZK-KIT, Denney Kitfox II, 14 Nov 04 at 11:35, Hawera. POB 1, injuries nil, damage substantial. Nature of flight, private other. Pilot CAA licence nil, age 76 yrs, flying hours 1026 total, 297 on type, 10 in last 90 days.

The aircraft landed with a 25-knot tailwind and failed to stop before the end of the runway. The aircraft went through a fence and tipped over onto its back.

Main sources of information: Accident details submitted by pilot.

CAA Occurrence Ref 04/3553

ZK-GSA, Glaser-Dirks DG-200, 20 Nov 04 at 13:00, Rangiwahia. POB 1, injuries nil, damage substantial. Nature of flight, private other. Pilot CAA licence PPL (Aeroplane), age 56 yrs, flying hours 967 total, 27 on type, 17 in last 90 days.

During a landing in a soft paddock, the glider's undercarriage was torn from the fuselage.

Main sources of information: Accident details submitted by pilot.

CAA Occurrence Ref 04/3988

ZK-MHS, Lancair International Lancair 360, 3 Dec 04 at 16:05, Great Barrier. POB 2, injuries nil, damage substantial. Nature of flight, private other. Pilot CAA licence PPL (Aeroplane), age 59, flying hours 271 total, 93 on type, 12 in last 90 days.

The aircraft was landing on Runway 28 at Great Barrier in moderately gusty crosswind conditions. The aircraft landed on the grass to the left of the seal. The nose gear compression strut failed. The wheel assembly rotated aft, lowering the aircraft slightly, causing the propeller to strike the grass and turf.

Main sources of information: Accident details submitted by pilot.

CAA Occurrence Ref 04/3857

ZK-HHA, Robinson R22 Beta, 20 Dec 04 at 21:00, Bonshaw Park, Taupo. POB 0, injuries nil, damage substantial. Nature of flight, private other. Pilot CAA licence CPL (Helicopter), age 33 yrs.

The pilot vacated the helicopter, leaving the engine running. The collective moved up and the helicopter took off, turned 360 degrees, and went 10 feet into the air before settling in some pine trees.

Main sources of information: Accident details submitted by pilot and operator.

CAA Occurrence Ref 04/4035

ZK-UBD, Europa XS, 17 Jan 05 at 12:45, Ardmore. POB 2, injuries nil, damage substantial. Nature of flight, private other. Pilot CAA licence ATPL (Aeroplane), age 27 yrs, flying hours 4000 total, 60 on type, 80 in last 90 days.

It was reported that the pilot lost control of the aircraft during touchdown. The aircraft ground-looped, the propeller contacting the runway.

Main sources of information: Accident details submitted by pilot and operator.

CAA Occurrence Ref 05/45

ZK-HNY, KHI Kawasaki-Hughes 369HS, 13 Jun 05 at 13:00, Lake Mavora. POB 0, injuries nil, damage substantial. Nature of flight, private other. Pilot CAA licence CPL (Helicopter), age 44 yrs, flying hours 1561 total, 770 on type, 16 in last 90 days.

The pilot reported that he had landed on the snow to refuel. The rpm had been reduced to flight idle, and control frictions were applied. While the pilot was outside of the helicopter, it slid on the snow surface and tipped over.

Main sources of information: Accident details supplied by pilot.

CAA Occurrence Ref 05/1870

ZK-LTD, Piper PA-31, 8 Jul 05 at 15:00, Auckland. POB 3, injuries nil, damage substantial. Nature of flight, transport passenger A to B. Pilot CAA licence CPL (Aeroplane), age 56 yrs, flying hours 10,212 total, 30 on type, 16 in last 90 days.

After start of the righthand engine, the pilot, in carrying out a hydraulic check, inadvertently selected the landing gear to the UP position instead of DOWN. Later, engineering could not fault or determine why the solenoid-operated anti-retract pin appeared not to have functioned.

Main sources of information: Accident details supplied by pilot and operator plus further enquiries by CAA.

CAA Occurrence Ref 05/2210

ZK-HZR, Robinson R22 Beta, 11 Sep 05 at 08:25, Addington. POB 2, injuries 2 minor, damage substantial. Nature of flight, private other. Pilot CAA licence PPL (Helicopter), age 58 yrs, flying hours 283 total, 118 on type, 6 in last 90 days.

The helicopter had just left Wigram in poor weather conditions when it suffered a loss of power. The pilot carried out an autorotation, but the helicopter landed heavily and tipped onto its side.

Main sources of information: Accident details supplied by pilot plus further enquiries by CAA.

CAA Occurrence Ref 05/2911

ZK-PDQ, Neico Aviation Lancair 320, 18 Oct 05 at 15:00, Motuapa. POB 2, injuries 2 serious, aircraft destroyed. Nature of flight, private other. Pilot CAA licence CPL (Aeroplane), age 67 yrs, flying hours 25,000 total, 180 on type, 10 in last 90 days.

The Neico Aviation Lancair 320 had departed Taupo aerodrome for a local scenic flight; on board were the pilot/owner and a passenger. During the climb, at approximately 5000 feet a very loud bang was heard accompanied by a severe vibration. The pilot elected to carry out a forced landing on to State Highway 1. During the final stages of the approach a wingtip struck the road, the aircraft hit a power pole and broke up; an intense fire started. The pilot released and then assisted his passenger to evacuate the aircraft; some witnesses at the scene assisted both men and took them to the lakeshore to give first aid to their burns, but each had sustained serious burns to their upper bodies. The aircraft was consumed by the intense fire, with only the engine and some metal components surviving the fire. The aircraft engine was removed and dismantled by a specialist aviation engineering organisation. The engine turned over satisfactorily, but the fuel control unit, fuel flow divider and mechanical fuel pump were burnt beyond any ability to inspect. The spark plugs and exhaust ports exhibited normal running, and there were no obvious mechanical failure indicators. The cause of the vibration could not be determined.

Main sources of information: Accident details submitted by Police and pilot plus further enquiries by CAA.

CAA Occurrence Ref 05/3356

ZK-THA, Tecnam P92 Echo Super, 30 Jan 06 at 17:24, Dannevirke. POB 2, injuries 1 serious, 1 minor, damage substantial. Nature of flight, private other. Pilot CAA licence PPL (Aeroplane), age 41 yrs, flying hours 129 total, 10 on type, 4 in last 90 days.

The microlight was taking off when at approximately 60 feet it was observed dropping the left wing and then turning steeply towards the ground. The pilot managed to partially recover the aircraft and land it heavily off to one side of the runway. The aircraft sustained substantial damage. The pilot reported the aircraft engine had suffered a sudden power loss. The engine was tested but no fault was found and there did not appear to be any fault with the fuel system or settings. Carburettor icing is not suspected as the atmospheric conditions were not conducive to icing. No cause for the accident could be determined from the information available.

Main sources of information: Accident details submitted by pilot plus CAA engineering investigation.

CAA Occurrence Ref 06/217

ZK-JIO Polikarpov I-16 Type 24, 2 Mar 06 at 11:30, Wanaka. POB 1, injuries nil, damage substantial. Nature of flight, private other. Pilot CAA licence CPL (Aeroplane), age 52 yrs, flying hours 1800 total, 354 on type, 25 in last 90 days.

The pilot found that the left brake was ineffective during the landing roll. As a result the aircraft departed the runway, the left main gear leg collapsed, and the aircraft groundlooped, causing some damage to the left wing and a bent propeller.

Main sources of information: Accident details supplied by pilot.

CAA Occurrence Ref 06/728

ZK-SFE, Diamond DA20-C1, 2 Mar 06 at 16:24, Waiheke Island Ad. POB 2, injuries 2 minor, aircraft destroyed. Nature of flight, training dual. Pilot CAA licence CPL (Aeroplane), age 23 yrs, flying hours 1239 total, 160 on type, 80 in last 90 days.

The aircraft was on a cross country training exercise from Hamilton, with a planned approach and overshoot at Waiheke Aerodrome. The flight proceeded normally until the approach at Waiheke. At the pre-determined go-around point, the trainee pilot flying the aircraft advanced the throttle to full power, but the engine power increased momentarily then failed. The throttle was retarded to idle then reapplied with no apparent effect.

The instructor took control and attempted to land on the airfield, but in the process, the aircraft landed heavily, left wing first. The left wing failed at the root, the propeller struck the ground and disintegrated, and the aircraft came to rest on its left side after slewing through almost 180 degrees. The pilots escaped with only minor injuries, and walked to the airfield operator's house to report the accident.

During 2004, ZK-SFE suffered four reported instances of the engine stopping after landing. This problem was eliminated after TCM SB 04-4 was incorporated, replacing the top spring in the manifold valve with one of lower pressure. ZK-SFE had the correct spring at the time of the accident.

The engine was overhauled in October 2005, and since that time the aircraft experienced seven other events where the engine either failed to respond to throttle application from low power or stopped after landing. Despite extensive troubleshooting of the problem, no definite cause could be established.

On testing after the accident, the fuel control unit was found to be set slightly lean at low power settings. In the absence of any other indication, this is considered to be the most likely cause of the intermittent power losses. The engine-driven fuel pump appears to have been operating to specification and is not believed to be a factor in this event.

Main sources of information: Accident details submitted by pilot and operator, plus further enquiries by CAA.

CAA Occurrence Ref 06/626

ZK-ENG, North American Harvard 3*, 17 Apr 06 14:20, Omaka. POB 2, injuries nil, damage substantial. Nature of flight, private other. Pilot CAA licence CPL (Aeroplane), age 28 yrs, flying hours 535 total, 17 on type, 20 in last 90 days.

The pilot reported that a swing to the left developed on the landing roll, which could not be controlled, and which developed into a ground-loop to the left. The left main undercarriage leg collapsed, and the left wingtip contacted the ground.

Main sources of information: Accident details submitted by pilot.

CAA Occurrence Ref 06/1328

ZK-HET, Hiller UH-12E, 3 May 06 at 16:00, Argyle Station. POB 2, injuries nil, damage substantial. Nature of flight, agricultural. Pilot CAA licence CPL (Helicopter), age 24 yrs, flying hours 915 total, 270 on type, 189 in last 90 days.

The main rotor blade struck the loading bucket while a landing was being made at the landing site.

Main sources of information: Accident details submitted by pilot and operator.

CAA Occurrence Ref 06/1643

ZK-HFC, Bell 206B, 16 May 06 at 17:05, Kerikeri. POB 1, injuries minor, damage substantial. Nature of flight, agricultural. Pilot CAA licence CPL (Helicopter), age 44 yrs, flying hours 3000 total, 2000 on type, 100 in last 90 days.

The helicopter suffered a loss of power, so the pilot jettisoned the load and carried out an autorotation onto a road. The helicopter landed heavily and slid off the road, rolling onto its side in a ditch. The fuel system was found to be contaminated with a clear gel-like matter. Despite extensive testing, the source of the contamination could not be determined.

Main sources of information: Accident details submitted by pilot plus CAA engineering investigation.

CAA Occurrence Ref 06/1830

ZK-HWC, KHI Kawasaki-Hughes 369D, 15 Jun 06 at 14:15, Timaru. POB 2, injuries nil, damage substantial. Nature of flight, other aerial work. Pilot CAA licence CPL (Helicopter), age 41 yrs, flying hours 1273 total, 405 on type, 50 in last 90 days.

During a power lines inspection for a power company, a landing was required due to a sick passenger. During the landing phase, the helicopter struck one strand of a three-strand power line, causing substantial damage to the helicopter.

Main sources of information: Accident details submitted by pilot.

CAA Occurrence Ref 06/2221

ZK-CDE, Morane-Saulnier MS 880B, 17 Jul 06 at 13:00, Awatere Valley. POB 1, injuries nil, damage substantial. Nature of flight, private other. Pilot CAA licence PPL (Aeroplane), age 57 yrs, flying hours 1051 total, 1000 on type, 11 in last 90 days.

The pilot reported that while the aircraft was in the cruise, the engine began to lose power and stopped. A forced landing was made into dense scrub.

Main sources of information: Accident details submitted by pilot plus further enquiries by CAA.

CAA Occurrence Ref 06/2681

GA DEFECT INCIDENTS

The reports and recommendations that follow are based on details submitted mainly by Licensed Aircraft Maintenance Engineers on behalf of operators, in accordance with Civil Aviation Rules, Part 12 *Accidents, Incidents, and Statistics*. They relate only to aircraft of maximum certificated takeoff weight of 9000 lb (4082 kg) or less. These and more reports are available on the CAA web site, www.caa.govt.nz. Details of defects should normally be submitted on Form CA005 or 005D to the CAA Safety Investigation Unit.

The CAA Occurrence Number at the end of each report should be quoted in any enquiries.

Key to abbreviations:

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

Britten-Norman BN2A-26

Lycoming O-540-E4C5 Magneto drive gear bearing P/N 67542

While refitting a magneto after a 500-hour inspection, the engineer noticed some unusual movement in the magneto drive adapter. Upon removing the magneto drive adapter from the engine, it was found that the support bearing ball race was missing. Investigation revealed pieces of the race in the engine sump. TSO 551.4 hours.

ATA 7410 CAA Occurrence Ref 05/3924

Cessna 172K

Cessna 172K Engine mount/fuselage bracket P/N 0513132-11

The aircraft was in for a 50-hour inspection, when it was found that the top left engine mount was not secure at the firewall. Investigation found the engine mount behind the firewall had fractured. All the other engine mount points were inspected and found satisfactory. A new bracket was fitted. TSI 49 hours, TTIS 8000 hours.

ATA 5300 CAA Occurrence Ref 05/3821

De Havilland DH 82A Tiger Moth

De Havilland Gipsy Major 1 Cylinder head

After start the engine ran extremely roughly. Number 2 cylinder was found to have no compression. During disassembly the valve faces and seats were noted to be in poor condition. Compression was restored following rework to the valves and valve seats, and replacement of cylinder mounting flange gasket. The defect was attributed to wear and aging of engine parts. TSI 378.1 hours.

ATA 7100 CAA Occurrence Ref 06/1305

De Havilland DH 84 Dragon

De Havilland DH 84 Aileron cables

The pilot reported that after takeoff for a display flight, the aileron controls jammed. Investigation found the aileron cables slack enough to allow the chain to disengage from the sprocket teeth. The cable was re-tensioned and aileron controls checked out satisfactorily. The aileron cable tension will be checked as part of future pre-flight inspections.

ATA 2700 CAA Occurrence Ref 06/536

Pacific Aerospace Cresco 08-600

Pacific Aerospace Corporation 08-51071-1 Engine mount P/N 08-51071-1

The maintenance provider reported that a crack was found in the lower engine mount attachment frame during the first scheduled inspection following importing of the aircraft. A repair scheme was developed and the engine frame repaired by installing gusset plates. The repair was inspected at the next scheduled maintenance inspection and found to be functioning satisfactorily. TSI 134 hours, TSO 5953 hours, TTIS 5953 hours.

ATA 7120 CAA Occurrence Ref 05/3739

Piper PA-18-150
Tow hook internal spring

Half an hour into a banner towing flight, the banner became detached from the tow aircraft. The internal spring of the tow hook had failed. The spring was removed and replaced.

ATA 5300 CAA Occurrence Ref 06/763

Piper PA-23-250
Piper PA23-250F Landing gear selector lever P/N 752-303

The landing gear selector broke off. This was attributed to frequent bending of the lever by the flight crew while occupying or vacating the pilot seat. This is a known problem with this type of lever; refer to AD DCA/PA23/155A. New improved lever fitted, P/N 761-213.

ATA 3200 CAA Occurrence Ref 05/4375

Piper PA-28-140
Lycoming O-320-D2A Carburettor P/N IO-3678-32

The pilot reported engine rpm fluctuations. When carburettor heat was turned on, a large drop in rpm was observed. Investigation found that the screws attaching the top and bottom bowl halves for the carburettor were loose. The movement had allowed wear on the main jet and venturi in the carburettor. The cause was attributed to failure of the tab washers to lock the mounting screws properly, allowing them to vibrate loose.

ATA 7320 CAA Occurrence Ref 06/234

Piper PA-28-181
Lycoming O-360-A4M Vacuum pump

During an IFR flight, the vacuum light illuminated. Failure of the vacuum system was confirmed by the suction gauge indicating zero. The aircraft was diverted to another aerodrome, and later was ferried to a maintenance facility, where a new vacuum pump was fitted. The new vacuum pump allows carbon vane wear to be more easily assessed. An engineering inspection of the original vacuum pump determined it was a re-manufactured unit, which proved to be less reliable than a new unit.

ATA 3700 CAA Occurrence Ref 05/4094

Piper PA-34-220
Mechanical Fuel Pump P/N 654351-2

The instructor simulated a failure on the right engine. As the student was carrying out drills to secure the simulated failed engine, the left engine backfired and stopped. The instructor cancelled the exercise and increased power on the right engine. The left engine was restarted as the electric fuel pump was switched on during trouble checks. The aircraft was landed using both engines. Investigation found that the mechanical fuel pump drive coupling had sheared due to seizure of the fuel pump. A new pump and drive were fitted. TSI 9 hours, TSO 398 hours, TTIS 2749 hours.

ATA 8500 CAA Occurrence Ref 05/3676

Robinson R22 Beta
Tech Tool Plastics Inc Right cabin door P/N R22-101-54

A crack was discovered in the right cabin door, extending from the centre pivot on the door latch system, and running through the composite door frame. The reason for the crack was not determined, as the door did not appear to be pre-stressed by any misalignment or have any pre-existing defect. TTIS 601.3 hours.

ATA 5310 CAA Occurrence Ref 06/367

Robinson R44
Main rotor blades P/N C016-2

Both main rotor blades were found to have suffered extensive hail damage to the upper surfaces after the helicopter was outside in a hailstorm. The manufacturer was contacted, who advised that the upper blade surfaces were only 0.008 inches thick and declared them unserviceable. Replacement blades were installed. TSI 58 hours, TTIS 1452 hours.

ATA 6200 CAA Occurrence Ref 06/397

Robinson R44
Lycoming O-540-F1B5 Number 2 cylinder

During a leakdown check on the engine, number 2 cylinder returned a reading of 58/80, and was found to have the top piston ring broken. A replacement cylinder assembly was fitted. TSI 58 hours, TTIS 1633 hours.

ATA 8530 CAA Occurrence Ref 06/398

Robinson R44 II
Wooden block

The helicopter had a 50-hour maintenance inspection, which included an inspection of the clutch. A block of wood had been used to support the drive assembly while reinstalling the clutch. An inspection of the transmission deck was carried out prior to closure of the cowls. The inspection did not detect the block of wood, which was still present but had slipped into an area which was not easily seen. Some time later a pilot carrying out a pre-flight inspection found the block of wood on the transmission deck. To assist in preventing a recurrence, the engineer has now painted all blocks of wood that support components during maintenance white, and attached a red length of material to them. He now also requires the pilot, where appropriate, to carry out a pre-flight inspection of the helicopter, and to sign for it on the work sheets prior to signing a Release to Service.

ATA 6510 CAA Occurrence Ref 05/4401

R44 clutch support block with streamer attached.

These people are having a **SAFE** and **ENJOYABLE** Flight

They followed this advice

- Get a full weather briefing
- Update the weather information en route
- Have options for diversion at all times
- Carry extra fuel
- File a flight plan
- Do not succumb to ‘get-home-itis’

DO NOT PRESS ON INTO BAD WEATHER