September/October 2011

POINTING TO SAFER AVIATION

vector

Runway Excursions

The Language Barrier

Managing Volcanic Ash

Just Call Us 'Paraparam'

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

vector

The Language Barrier

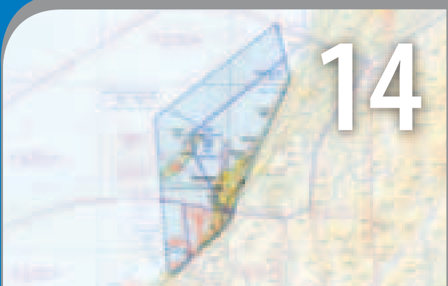
'IFR-speak' and 'VFR-speak' are like two different languages. In particular, standard IFR radio calls mean very little to the VFR pilot. We give advice for both IFR and VFR operators on how to protect yourselves while operating at an unattended aerodrome.

Runway Excursions

Keeping on the straight and narrow – or the straight and wide, as the case may be – is the aim of every pilot on takeoff and landing. Occasionally, however, the execution diverges from intention, and the aircraft ends up in the vicinity of the runway instead of on it.

Managing Volcanic Ash

The CAA's Volcanic Ash Advisory System enables airline operators make their own decisions on whether to fly or not when faced with volcanic ash. How does this system work? And how well is New Zealand doing internationally?



Just Call Us 'Paraparam'

It's not controlled, and it's not unattended. Learn more about what Paraparaumu's Aerodrome Flight Information Service offers you, and how you should interact over the radio with the Flight Service Specialists who are now staffing the tower.

Cover: Caribbean Airlines Flight BW523 overran Runway 06 on landing at Georgetown, Guyana, on 30 July 2011. Despite substantial damage to the aircraft, there were no fatalities. The accident is still under investigation. Photo courtesy of Mike Charles, www.wildguyana.com.

In this issue...

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Tel: +64 4 560 9400,
Fax: +64 4 569 2024,
Email: info@caa.govt.nz.

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Manager Communications Bill Sommer.

Editor Peter Singleton.

Safety Education Publishing Team
Alister Buckingham, Lakshmi Guda, Ken Mathews, Emma Peel, Anna Walkington, Rose Wood.

Design Gusto.

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View from the right hand seat of a B1900D as it turns right at TARAX for the RNAV (GNSS) B approach at Wanaka.

The Language Barrier

IFR Translated for VFR

'IFR-speak' and 'VFR-speak' are like two different languages. Standard IFR radio calls such as, "commencing the RNAV Bravo approach", may mean very little to the VFR pilot, and IFR pilots may be equally unsure of local visual reporting points, as these are not marked on the instrument approach plate in front of them.

The potential for conflict between IFR and VFR traffic at unattended aerodromes increases when the cloud base is between 1000 and 2000 feet AGL – good enough for VFRs to be out and about, but low enough that IFR traffic will be popping out of IMC relatively close to the ground. It is difficult to spot traffic unless you know roughly where to start looking. Confusion over the meaning of each other's radio calls can increase the potential for conflict.

For VFR pilots, it is important to know that once an IFR aircraft becomes visual, it is still following a prescribed IFR procedure, and if they do not get visual, there is a set procedure they must follow on reaching the decision height/altitude for the approach – this is called the missed approach.

So what can each of us do to protect ourselves while operating at an unattended aerodrome?

Advice for IFR

Listen out for VFR traffic early, before you are required to change from control to the local frequency, and make an early radio call (at least 20 NM away) giving a time that you will be commencing the approach, or if you can, a time you will be overhead a visual reporting point (VRP).

At Timaru, for example, you could say, "Timaru traffic, ABC 30 miles northeast, 6000 feet, shortly commencing NDB/DME 20 approach from the north, estimate circuit area time 45".

This radio call is the cue for relevant VFR traffic to respond by broadcasting their position, altitude and intentions. IFR pilots should be aware that any responses they receive cannot be relied on entirely for a full and accurate picture, as NORDO aircraft could be operating. A good lookout remains essential.

As an IFR pilot you are legally required to make standard IFR radio calls – but don't stop there. For the benefit of VFR pilots, also give your distance and direction from the aerodrome. If you are visual, or you have local knowledge of the area, you could describe your position, altitude and intentions relative to visual reporting points (if promulgated) or prominent features on the ground.

For example, "Timaru traffic, ABC established 10 mile arc, 3000 feet, for NDB/DME 20 approach. Currently 10 miles northeast of the aerodrome. Intentions are overflying Temuka on finals for Runway 20".

If you hear VFR traffic operating in the area, and you are unsure of their position or intentions, it is a good idea to call them directly to clarify this. Using plain language may assist. If you still have concerns, *AIP New Zealand* ENR 1.5 chapter 4.27 *IFR Arrival Procedures – Unattended Aerodromes*, says that where a traffic confliction is likely, descent in IMC should be restricted to 1200 feet above aerodrome elevation. This is a good idea if VFR aircraft are operating in the circuit. Avoid the mindset that you will be arriving with right of way. Be prepared to slow down early, and brief your alternate options (missed approach or hold).

Continued over ❯❯

If you choose an instrument approach with a tailwind component, because it is the most economic, and VFR traffic is using an into-wind runway, rule 91.223 (2) requires that you circle to conform to the established traffic pattern.

If you are unsure where the VRPs are at your destination aerodrome, consider taking a VNC with you.

Advice for VFR

The visual navigation charts have a purple teardrop-shaped symbol showing the general, but not exact, location of instrument approach tracks. If you hear an IFR aircraft on an approach, don't fly directly beneath the cloud ceiling in the vicinity of an instrument approach, and always adhere to the VFR met minima.

If your aerodrome has more than one of these purple symbols on the chart, it is a good idea to look up the name and location of each of the approaches on the *AIP New Zealand* web site, www.aip.net.nz. With this knowledge, you can work out which direction IFR aircraft are coming from (in case the IFR pilot does not give their distance and direction from the aerodrome in their radio call). This pre-planning is helpful because the names of some approaches do not include a runway designator to give you a clue as to its location, for example an 'RNAV (GNSS) A'.

If you hear an IFR aircraft on approach, broadcast your position, altitude and intentions – giving an accurate distance and direction from the aerodrome is most helpful. If you are unsure of the IFR aircraft's position, don't be afraid to call them up and ask for clarification. Always make sure your transponder is on ALT (Modes A and C), so that IFR aircraft equipped with ACAS/TCAS can see you on their screen. If the aerodrome is within an MBZ, both IFR and VFR aircraft must also make the required MBZ radio calls.

Busy IFR/VFR Unattended Aerodromes

Here is some advice for specific unattended aerodromes with scheduled IFR operations and significant VFR traffic.

Whangarei

Whangarei has four instrument approaches. Three are from the south, beginning at the Springfield NDB, and one is from the southwest.

If you hear an IFR aircraft approaching, it is a good idea for VFR aircraft to avoid operating in the inner Whangarei Harbour area, unless you are operating in the circuit or low flying area. This will keep you clear of the approach and missed approach tracks of all four approaches.

Scheduled operators use the approaches from Springfield more often than the RNAV (GNSS) RWY 06 from the southwest. By day, and if they are visual, aircraft on an approach from Springfield may break off and begin circling to land before they reach the missed approach point. Watch out for this between Hewlett Point and Limestone Island (these are not labelled on the VNC, but have been labelled on the map below).

If IFR aircraft do not get visual early, they may fly a reverse circling procedure. This involves turning over the runway to follow the entire circuit.

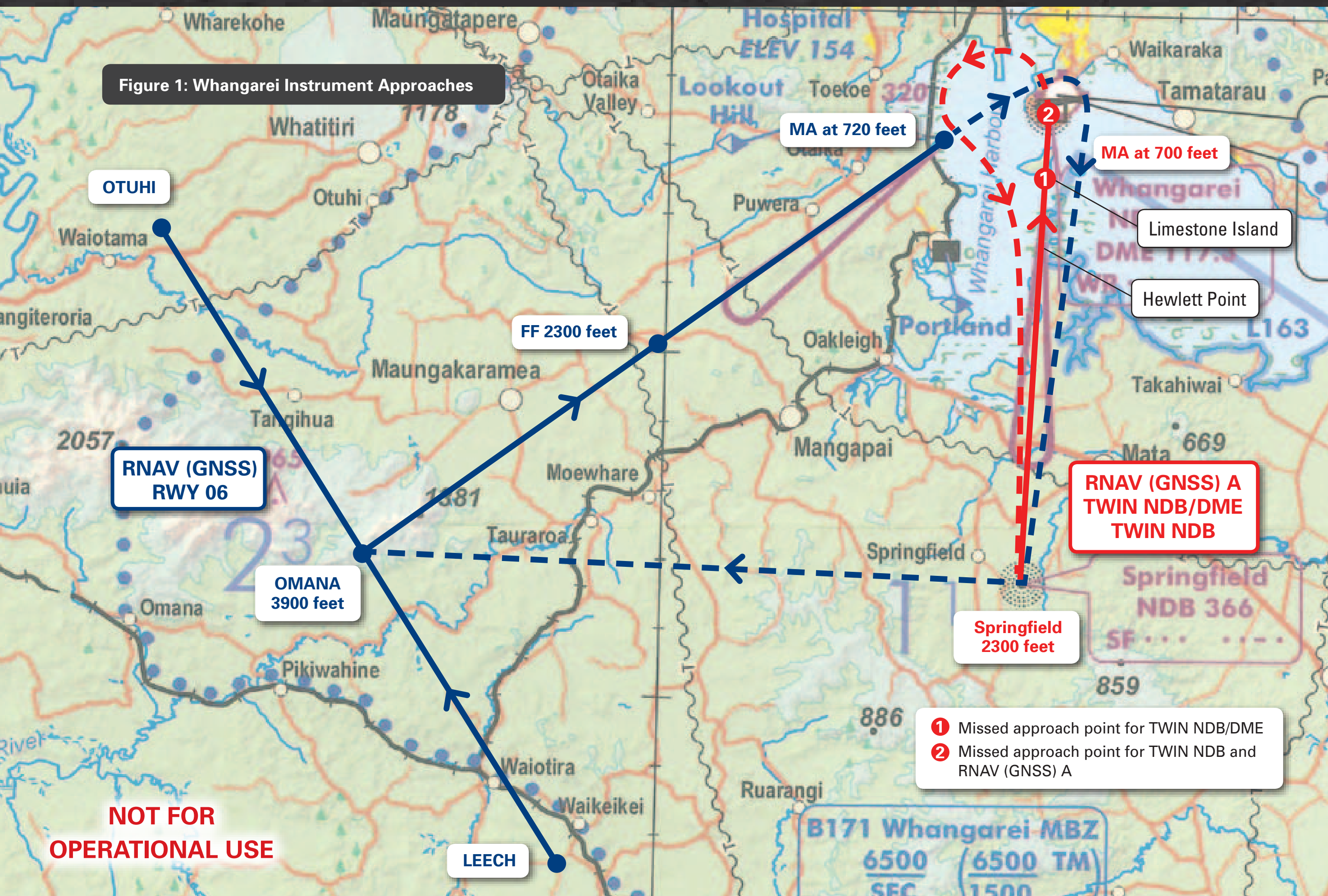

Figure 1: Whangarei Instrument Approaches

If an IFR pilot is visual, there are plenty of visual features they can relate their position, altitude and intentions to while flying the approaches from Springfield in the south. On the RNAV approach from the southwest, however, this is very difficult because there are no well known settlements or landmarks along the approach track.

Taupo

Taupo has multiple instrument approaches, and all five are used by scheduled operators under different circumstances. Flights from the north will normally use the NDB/DME B approach via the 10 NM arc. The 10 NM arc is positioned just inside the northwestern boundary of the MBZ. Flights from the south predominantly use the NDB/DME A approach.

Wairakei is a useful VRP for IFR pilots to refer to (if they are visual) while approaching from the north. Wairakei VRP is a seven NM final for Runway 17. IFR pilots should watch out for gliders operating near Mt Tauhara and Centennial Park, and also be aware that SIDs requiring you to set heading overhead the Taupo NDB may not be suitable when parachuting is in progress.

It is common for VFR traffic to track via the shoreline to the southwest, or via Wairakei to the north. VFR pilots need to be aware that they are below instrument approaches in these areas. This makes it very important for VFR traffic listen out for exactly which approach IFR aircraft are using, so that they can make an informed decision about the safest way to arrive and depart from the aerodrome.

Continued over ❯❯

Figure 2: Taupo Instrument Approaches

Wanaka

There are two instrument approaches into Wanaka, but their approach and missed approach tracks over the ground are identical. This simplicity makes it easier for VFR pilots to anticipate the movements of IFR traffic. Scheduled operators will almost always fly the RNAV (GNSS) B approach, commencing at KALDI.

IFR aircraft enter uncontrolled airspace just south of KALDI, when they descend through 9500 feet.

If you are joining from, or departing towards Tarras, you will be following the same track as an aircraft on either instrument approach. It is a good idea to avoid flying along or transiting through a direct line between Tarras and the aerodrome.

If Runway 29 is in use, IFR aircraft will generally land straight-in if the cloud base is above approximately 4000 to 4500 feet AMSL. With lower cloud bases, IFR aircraft will fly a circuit to land once visual. For Runway 29, this involves flying along the runway, then commencing a right hand pattern to land.

If IFR aircraft make a missed approach, this may conflict with aircraft operating between the aerodrome and Wanaka township.

In a future issue of *Vector*, we will cover other aerodromes with scheduled IFR operations and significant VFR traffic. ■

Illustration Notes:

All heights are AMSL. Whangarei heights are for day operations only.

The heights labelled on Figures 1 to 3 for missed approaches are the lowest possible heights a category B aircraft will descend to before becoming visual.
The minima for Category C aircraft may be higher.

Dashed lines show missed approach path.

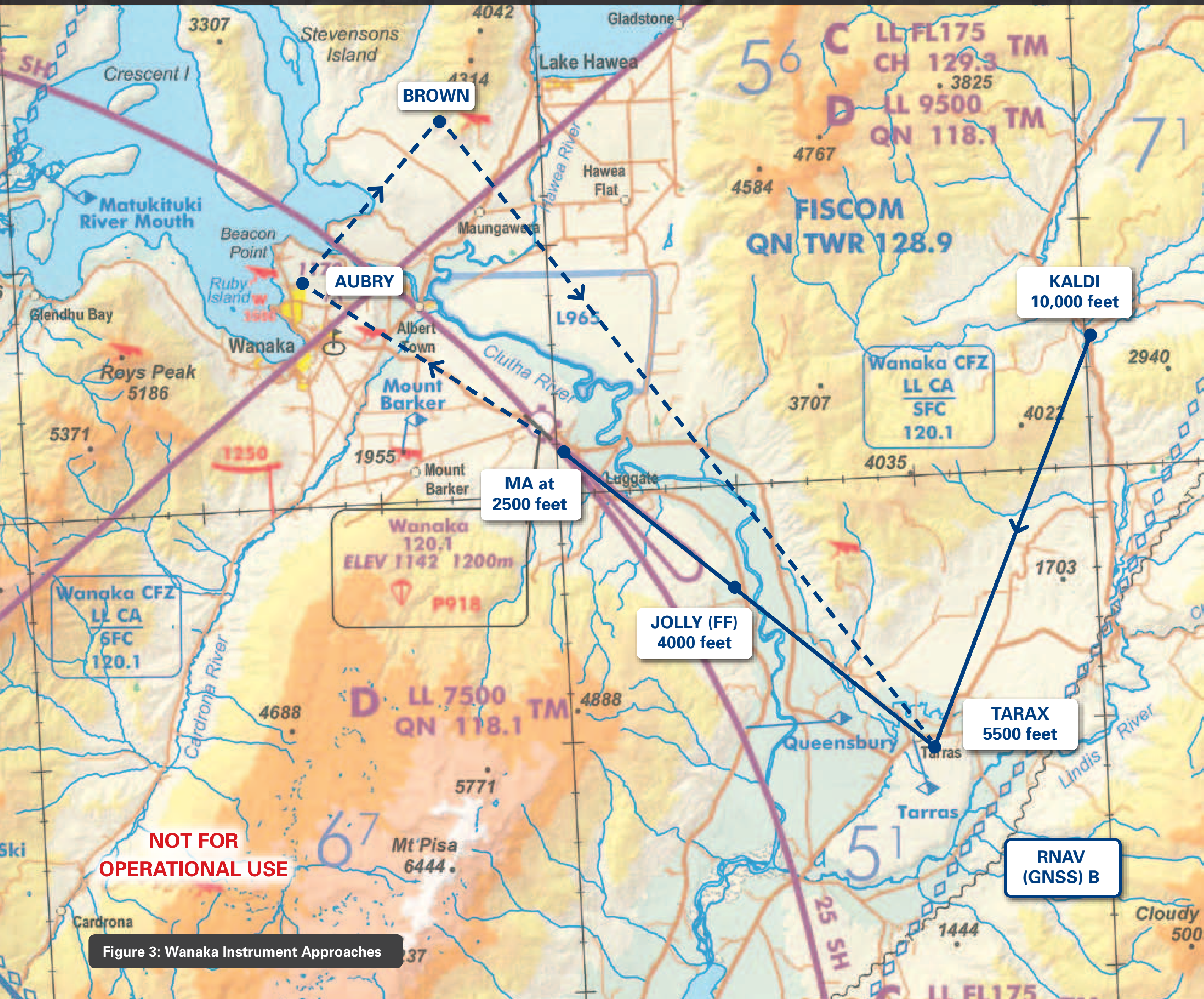

Figure 3: Wanaka Instrument Approaches

Helicopter photo courtesy of Southern Lakes Helicopters.
Frost texture: ©istock.com/peter zelei

Frost Fighting with Helicopters

Helicopters will soon arrive in numbers in wine-growing regions to fight frost. Two years ago, over 100 helicopters arrived in the Wairau Valley near Blenheim for frost protection work. The frost protection season, from October through November, affects vineyards throughout the country.

Frost is harmful to small fruit buds on plants such as grape vines, and can form when the air temperature drops below 5 degrees Celsius, on windless nights.

Helicopters fight frost formation by using rotor downwash to drive warm air from inversion layers above cool night air, down onto the plants.

Southern Lakes Helicopters Limited CEO Richard Hayes says his modern company helicopters are each equipped with digital temperature monitors to accurately determine the inversion layers, which generally form between 100 and 200 feet above the surface.

Minimise the Risk

"To minimise the risks, thorough planning is paramount. Pilots should have at least one hour before dark with the vineyard manager for planning, and complete an aerial reconnaissance of the work area to identify hazards and to positively identify the property boundaries.

"There is no room for shortcuts. Be in the area well before dark to prepare, otherwise stay at home," Richard says.

"Get adequate rest, and drink plenty of water. Sleep loss and dehydration can affect pilot performance. Food and rest are essential because operations can begin around midnight and go until dawn. Having two pilots available is a good safety measure, and common sense is essential."

Congestion around local fuel supply facilities can be a problem with many helicopters operating in one area. On several occasions Richard has been cut off at the refuelling site by other helicopters. This is an area that needs to be properly managed to reduce the risk of collision.

"A common radio frequency should be set up the afternoon before the frost work for use by all pilots. Have patience, don't run your fuel down too low and allow at least five minutes for the actual refuel," Richard advises.

Richard has seen helicopters arriving in an area to do frost work with only their landing lights and no backup lights, or no approved frost lights. He recommends all frost-fighting aircraft should have appropriate external lights fitted.

"Landing lights run very hot and can overheat and fail, particularly when operated at the low forward speeds during frost work.

"Cockpit lighting should also be compatible with night operations. It's important to be able to dim cockpit lighting to its lowest level to protect the pilot's night vision. Strobe lights should not be used because they can be disorientating and affect a pilot's night vision adaption. Full night adaption can take up to 45 minutes, but can be lost quickly if eyes are exposed to bright light."

Operating Tips

Richard offers some housekeeping tips.

"To prevent misting and frosting of helicopter windows, soft covers should be placed on external helicopter windows including the side panes, and be left in place until departure. Clear vision is vital. Don't leave the doors open to let the cold outside air inside, it can cause misting on the inside of windows. Carry a demisting cloth, and a torch with fresh batteries.

"Don't try to relieve the monotony by unnecessary chatter on the radio, or use the helicopter cellphone in talk to your mates and become distracted. These are unsafe practices that need to be managed using common sense.

"Make use of stand-down time during the night to refuel – this reduces fuel pump site pressures and allows for that extra weight on board that helps shift the air and makes the frost fighting delivery more efficient."

Further Reference

The September/October 2008 *Vector* includes information such as who can provide frost protection and informing the neighbours. ■

Runway Excursions

Keeping the aircraft within the confines of the runway during takeoff and landing is the intention of every pilot, but occasionally execution diverges from intention.

An article in the November/December 2007 issue of *Vector* discussed runway **in**cursions, and cited two major accidents as examples – the 1977 Tenerife collision between two Boeing 747s, with the loss of 583 lives, and the 2001 Milan collision between an MD-80 and a Cessna Citation, that killed 118.

Despite the high profile of accidents of this type, runway **ex**cursions are a far more common type of accident. A runway excursion is the departure of an aircraft from the runway surface, from either the runway end (an overrun) or the edge (a veer-off).

Runway excursions can occur on either takeoff or landing. According to Flight Safety Foundation (FSF) statistics for worldwide air transport accidents from 1995 to 2008, involving aircraft of over 5700 kg maximum takeoff weight, runway excursions comprised 97 per cent (417 of 431) of all runway-related accidents. Of the 417 runway excursion accidents, 34 were fatal, with a total of 712 lives lost. Landing occurrences outnumbered takeoff occurrences by about four to one.

How Do They Happen?

The Flight Safety Foundation's data analysis identified a number of risk factors for both the takeoff and landing cases. The most common risk factor in runway excursions on takeoff was a rejected takeoff above the takeoff decision speed (V_1) – the speed above which, in the event of an engine failure, takeoff must be continued, and below which, takeoff must be abandoned. It is calculated before each takeoff, and is dependent on aircraft weight and aerodrome dimensions.

Next most common was loss of directional control by the pilot, followed by rejected takeoff below V_1. Note that more than one risk factor may be present in any runway excursion event.

For landing occurrences, the number one risk factor was the failure to go around, followed by landing long, and runway

contamination leading to inadequate braking. Numerous other risk factors included approach and touchdown speeds too high, approach too high, crew resource management issues and non-compliance with standard operating procedures.

All of the risk factors listed are equally applicable in New Zealand, including runway contamination by snow, slush, or standing water.

Not Just Big Aeroplanes

Runway excursion accidents do not involve only heavy air transport aircraft. Sampling of the CAA database records from 1 January 2006 to 31 December 2010 identified 28 light aeroplane and glider runway excursion accidents, of which 12 were overruns and 16 were veer-offs. A few accidents where the veer-off resulted from undercarriage failure in a heavy landing were not included. Nineteen occurred on landing, eight on takeoff, and one was not specific.

While most operators of large aircraft will have well-defined procedures that, when followed, should minimise the risk of a runway excursion, light aircraft owners and operators may not have access to similar information to assist with decision making and risk management relating to taking off and landing. A study of the FSF *Report of the Runway Safety Initiative* (available on http://flightsafety.org/current-safety-initiatives/runway-safety-initiative-rsi) will quickly conclude that most or all of the risk factors listed for the takeoff and landing cases are equally applicable to light aircraft. The astute pilot may be able to identify more that apply only to the light end of the spectrum – for example, the wide variety of surfaces utilised for takeoff and landing, as against the generally sealed-runway environment of large air transport aircraft.

Decisions, Decisions – Taking Off…

A successful takeoff starts at the planning stage – the correct calculations of required takeoff distance and V_1 in particular. Occasionally, an accident can be traced back to an error at this point.

Although V_1 is the takeoff decision speed, in reality there should be no decision involved, as the required actions are clearly defined. Something wrong below V_1, we stop; above V_1, we go. Simple! Or so it seems. Why, then, are crews attempting rejected takeoffs above V_1 when it is extremely likely that the aircraft won't stop before reaching the end of the runway? In some cases, the crews have assessed the risk of continuing to be greater than the risk of an overrun, and in others, an abnormal sound, or something feeling "not quite right".

In the case of the Kalitta Air Boeing 747-209F accident at Brussels Airport in May 2008, an abnormal sound prompted a rejected takeoff at V_1 + 12 knots, resulting in a 300-metre overrun that terminated on the lip of a 20-metre railway cutting. During the overrun, the aircraft broke into three distinct portions as a result of a 4-metre drop over the aerodrome ring road.

The V_1 calculation was based on the full runway length, but 300 metres of available takeoff run was not used, and reverse thrust was not selected after the takeoff was rejected. The abnormal sound was a loud bang from a compressor stall on number 3 engine, caused by the ingestion of a small bird. There were other contributing factors, which can be studied in the full report, available on the link http://www.mobilit.fgov.be/data/aero/accidents/AA-8-5.pdf.

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Photo: ©istock.com/brytta

…And Landing

As for the takeoff case, a successful landing starts at the planning stage, with correctly-calculated landing performance figures. These may need to be updated in flight as conditions change, and the importance of having the latest aerodrome information cannot be overemphasised.

Although the criteria for a safe landing are not quite as sharply defined as V_1 on takeoff, an absolute prerequisite is a stabilised approach. The FSF ALAR (Approach and Landing Accident Reduction) Tool Kit lists the recommended elements of a stabilised approach as follows:

- » The aircraft is on the correct flight path, requiring only small heading or pitch changes to maintain it;
- » Speed is not more than V_{REF} +20 knots IAS or less than V_{REF} (note: V_{REF} is the calculated minimum speed at the 50-foot point for a normal landing);
- » The aircraft is correctly configured for landing;
- » Sink rate no greater than 1000 ft/min;
- » Power setting is appropriate for configuration, and not below flight manual minimum for approach;
- » All briefings and checklists have been completed;
- » Specific approach type criteria are fulfilled, eg, within one dot of glideslope on a Category I ILS.

Unique approaches, or abnormal conditions requiring a deviation from these criteria, will require a special briefing.

These components of a stabilised approach may differ slightly between operators, but the basic principles are the same. In general, an approach should be stabilised by 1000 feet above aerodrome elevation in IMC, and by 500 feet in VMC. Whatever criteria an operator has established must be followed.

While light aircraft have more flexibility in getting 'in the groove', it is equally imperative that an approach be set up correctly by a predetermined point – all the careful calculations that tell you that you will be able to land and stop your Group 6 aeroplane on that Group 5 runway will be of no use whatever if you arrive too fast and/or too high – or with the wind on your tail.

When in Doubt, Go Around

If there is any doubt, there is no doubt – **go around**! Unstabilised approaches, whether in a large or small aeroplane, are a fairly reliable means of finishing up in the runway vicinity instead of actually on it.

There are several other factors involved in runway excursions, both on takeoff and landing. These include runway surface type and condition; runway contamination by water, snow or slush; tailwind or crosswind; and non-adherence to standard operating procedures.

Recommended further reading is on the FSF link mentioned earlier in the article, Advisory Circular AC91-3 *Aircraft Performance Under Part 91*, the CAA's GAP booklet *Takeoff and Landing Performance*, and the November/December 2007 *Vector* article *Short-Field Landings*. The AC, GAP booklet and *Vector* article are all available on the CAA web site, www.caa.govt.nz. Also of note is a two-part Australian Transport Safety Bureau report *Part 1 – A worldwide review of commercial jet aircraft runway excursions*, and *Part 2: Minimising the likelihood and consequences of runway excursions, An Australian perspective*, available on the ATSB web site www.atsb.gov.au/publications; and NLR-CR-2010-259 *A Study of Runway Excursions from a European Perspective*, on www.nlr-atsi.nl/eCache/ATS/14/919.pdf. ■

Photo courtesy of Mike Charles, www.wildguyana.com.

Director's Awards 2011

The Director of Civil Aviation, Steve Douglas, presented the Director's Awards at the Aviation Industry Association's annual dinner, held in Wellington in July.

Richard Leaper

Richard Leaper was presented with the Director's Award for an individual. The award recognises a long period of effort on Richard's part, mainly trying to develop New Zealand capability in the field of design and certification of modifications to large transport aircraft.

Passionate about aviation since he was a youngster, Richard opted for an engineering career in aviation. After a degree from Auckland University and a stint with the RNZAF, Richard took on an engineering role with Air New Zealand in 1986. Over the years, he focused more on certification as a means of enabling the sale of modification design to third parties.

Richard considers the 2004 Air New Zealand Boeing fleet upgrade his biggest achievement. He led the certification coordination of this project that involved five different regulatory authorities and the certification departments of seven major international suppliers.

"This would not have been possible if it was not for the CAA adopting rules based on an organisational approach to delegation much ahead of other regulators," he says.

Richard continues to be committed to international partnerships and working closely with the regulator.

"My personal mission statement is to create a level playing field for New Zealand aviation certification approval in the international arena to facilitate modification of large transport aircraft in New Zealand."

Currently, Richard is Chief Design Engineer of Altitude Aerospace Interiors, an Air New Zealand subsidiary.

Richard Leaper

Miriam (holding the Director's Award) and Roger Stevenson (to her left), with Skywork Helicopters' staff.

Skywork Helicopters

Skywork Helicopters was established as a direct result of Roger Stevenson's passion for helicopters, and his desire to own and operate helicopters himself.

Roger and his wife Miriam started the company in 1997, as a specialist agricultural and lifting operator. Now, 14 years down the line, Skywork Helicopters has been awarded the Director's Award for an organisation for the second time.

Skywork Helicopters were recognised for steadily demonstrating operational expertise and maintaining high standards of safety that exceed normal compliance requirements. The operator was awarded the Director's Award for the first time in 2000, recognising and appreciating their approach to certification under the then new Part 119/135 rules.

Skywork Helicopters has had a consistently low risk profile in the Part 135 and Part 137 helicopter sectors in which it operates. Roger, who runs the company with his extended family, says he learnt how to do things safely from his father Neville Stevenson, a highly experienced and successful pilot.

"I would like Skywork Helicopters to be a company with zero accidents and zero fatalities. If you can walk into this industry and retire out of it safely, that's quite an achievement. That's the goal for me and all the staff of Skywork," he says. ■

Managing **Volcanic Ash**

During June and July 2011, ash from the Puyehue-Cordón Caulle volcanic eruption in Chile was drifting in and out of extended areas of New Zealand and Australian airspace. Aircraft operators were making careful decisions on flight operations, because the ash cloud posed significant risks to aviation. Some airlines chose to continue operations, while others chose not to. These decisions were based on the operators' own risk management evaluation and the latest official information on the position and movement of the ash cloud.

The CAA's Meteorological Authority Manager Peter Lechner worked for many years at MetService before coming to the CAA. He holds qualifications in business administration and science and has run his own companies.
As well as managing the CAA's meteorological obligations, he currently heads the CAA's Funding Review working group. Peter exercises his PPL privileges out of Paraparaumu aerodrome whenever he can.

The Wellington VAAC

The 1995–1996 Mount Ruapehu eruption was New Zealand's first serious encounter with volcanic ash in modern aviation, and resulted in the cancellation of many domestic and international flights due to closure of airspace, and movement restrictions.

A risk-based regulatory and information strategy, the New Zealand Volcanic Ash Advisory System (VAAS), was then implemented by the CAA in 1997. This approach provides a dynamic and flexible response to volcanic ash without closing airspace, and allows airlines to make their own risk-based operating decisions.

The Wellington Volcanic Ash Advisory Centre (VAAC) was set up as part of this strategy in 1999.

Within this system, MetService operates the Wellington VAAC and the Meteorological Watch Office, providing warning information for aviation on behalf of the CAA. The system is also supported by Airways Corporation, GNS Science, and aircraft operators.

How it Works

The VAAC provides Volcanic Ash Advisories (VAAs) for the Wellington VAAC region. The VAAs contain actual and forecast information on expected ash movement out to 18 hours, in text and graphical form. The Meteorological Watch Office produces the Volcanic Ash SIGMETs for the New Zealand and Auckland Oceanic flight information regions.

Eruption information on New Zealand and Pacific volcanoes from GNS is important in the process, as are the communication systems and the NOTAM processes managed by Airways. Reports from aircraft on ash are critical in verifying ash forecasts.

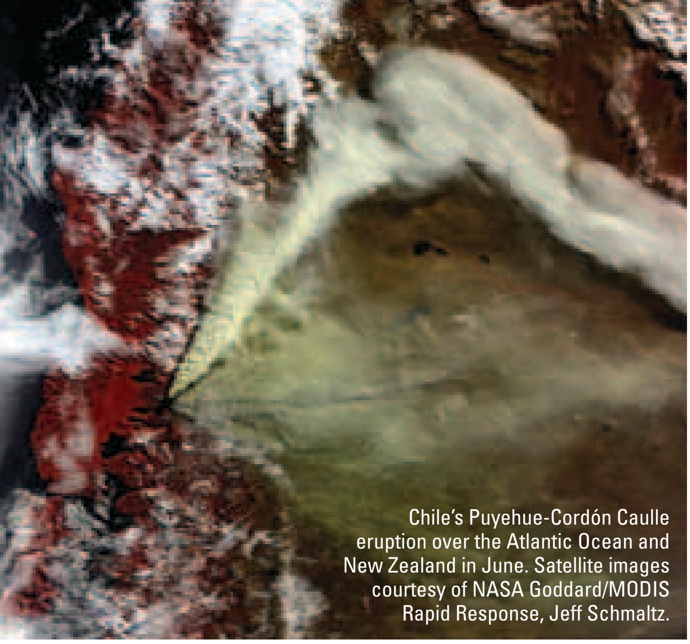
Both the VAAC advisories and SIGMETs describe the airspace that contains any identifiable ash. The airspace outside the areas defined can then be considered ash-free.

The CAA's Meteorological Authority Manager, Peter Lechner, is also the permanent Chair of ICAO's International Airways Volcano Watch Operations Group (IAVWOPSG) and Chair of ICAO's short-term International Volcanic Ash Task Force. He says that the lack of acceptable ash tolerance levels and the development needed in supporting science and forecasting are just one aspect in a range of major issues these two groups have been focusing on.

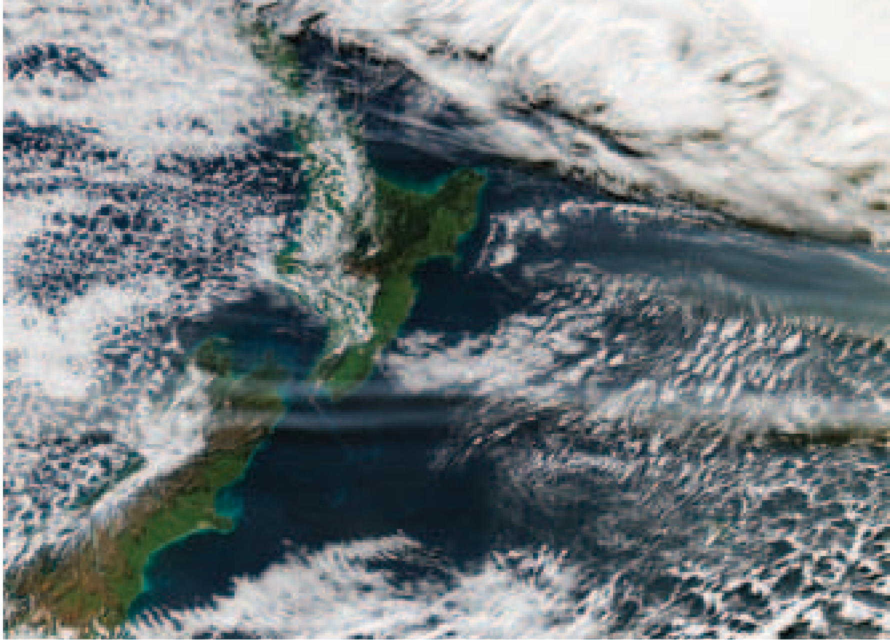
"We know that some airlines want to be able to operate in areas of very low density ash but, so far, engine and aircraft manufacturers have not yet been able to provide empirically proven specifications of acceptable ash tolerances (density levels). Similarly, the science around detecting and forecasting ash on the basis of density is also in relative infancy.

"The CAA expects the airlines to act responsibly and make appropriate operational decisions to avoid volcanic ash. This is consistent with the regulatory principles in the Civil Aviation Act and the CAA's regulatory philosophy generally.

"The VAAS approach provides information that the airlines can apply their risk management systems to and

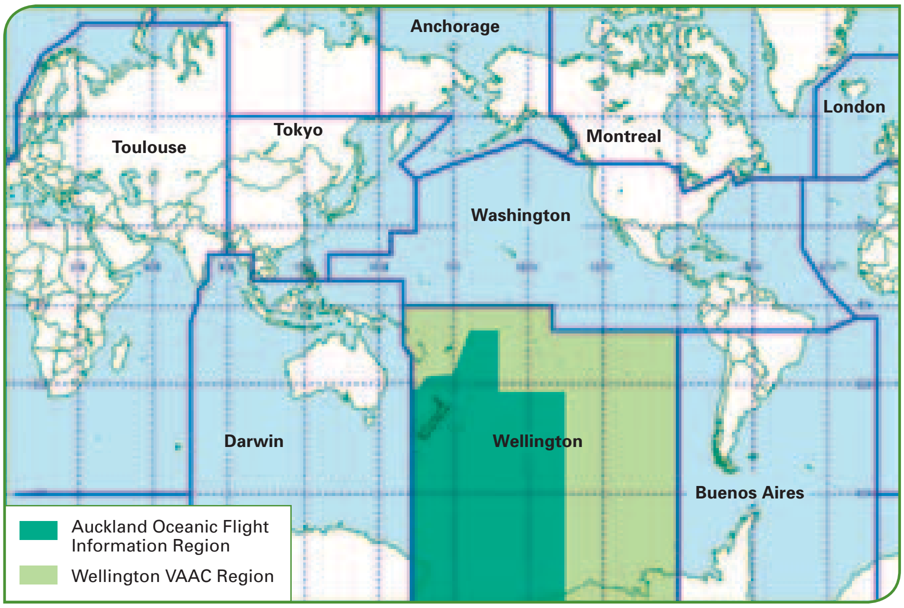


Chile's Puyehue-Cordón Caulle eruption over the Atlantic Ocean and New Zealand in June. Satellite images courtesy of NASA Goddard/MODIS Rapid Response, Jeff Schmaltz.



identify which routes are safe to fly. Airlines often add a further buffer to the ash boundaries according to their own management policies."

David Morgan, Chief Pilot for Air New Zealand, says, "We made our decision to operate by taking a previous CAA-approved risk assessment developed to address operations to London during the Icelandic volcanic eruptions. We then re-evaluated the risks to address the differing circumstances encountered in Australasia. Ash density modelling used in Europe was not feasible for this ash source 10,000 nautical miles away. So, rather than very occasionally flying through ash of low density, as operators did in Europe, we had to adapt our operations to fly under and around the volcanic ash. We worked very closely with the CAA, MetService, and ATS providers to ensure appropriate selection of routes and operating altitudes while providing real-time special air reports of ash, including reporting of no ash."



Puyehue-Cordón Caulle Eruption

The Puyehue-Cordón Caulle volcano threw up an estimated 100 million tons of ash, sand, and pumice. The ash from this eruption in Chile extended over wide areas of Australia, the Tasman Sea, New Zealand and South Pacific and Southern Oceans for much of June and early July 2011. This posed significant potential safety risks for aviation and affected large parts of Australian and New Zealand airspace, and the wider Wellington VAAC region.

"Our systems have been tested many times and have done well. There was the national Ruaumoko emergency exercise in March 2008, and the systems have also dealt with real eruptions from Ruapehu, White Island, and the Puyehue-Cordón Caulle ash event now," says Peter.

Over time, New Zealand has influenced the development of international volcanic ash warning systems. Many parts of the material now included in the specifications for the VAAs, Volcanic Activity Reports and VAAC procedures, reflect New Zealand's experience and leadership in the field.

Wellington is one of only nine VAACs operated as part of the wider International Civil Aviation Organization's (ICAO) volcanic ash initiative, with the nearest one being the Darwin VAAC.

NOTAMs

Volcanic Hazard Zones (VHZs) are designated under Part 71 *Designation and Classification of Airspace*, by the CAA's Aeronautical Services Unit.

The lateral and vertical dimensions of a VHZ are amended by NOTAM according to changes in volcanic activity advised by GNS Science.

New Zealand currently has four permanent Volcanic Hazard Zones: Ngauruhoe, Ruapehu, White Island, and Raoul Island.

Pilots intending to operate within a VHZ must read their NOTAMs in conjunction with the SIGMETs to get a complete picture, as part of their pre-flight briefing. ■

Just call us 'Paraparam'

It's not a controlled aerodrome, but it's not unattended either – so what should pilots say and when, now that Paraparaumu has an Aerodrome Flight Information Service?

The only other place in New Zealand that operates an Aerodrome Flight Information Service (AFIS) is Milford. If you don't often get down that way, you could be forgiven for not quite having the AFIS etiquette at your fingertips.

One of the first things to understand is that an AFIS is not a Control Tower. It is staffed by Flight Service Specialists who are not Air Traffic Controllers. They cannot limit your movements or direct you, and they certainly do not provide separation. A Flight Service Specialist can pass on an instruction from an Air Traffic Controller, but at Paraparaumu, this will only be clearances to IFR traffic from Wellington Control. The key point is that at an aerodrome with an AFIS you, the pilot, retain 100 percent responsibility for where you put the aircraft to maintain separation and sequence with other traffic.

The AFIS is there to help ensure you have all the information you need. It will provide weather, QNH, runway in use, significant traffic, and pertinent operational advice, such as bird hazards.

Paraparaumu has for a long time been within an MBZ, but now that it also has an AFIS, there are some subtleties in the RTF procedures to learn.

Establishing Communications

On first contact, establish communications with the AFIS before relaying your message. Even if the radio is quiet, a bustle can be going on in the tower. The Flight Service Specialist could be on the phone, taking an IFR clearance from Wellington Control, or could even have popped out for ablutions.

Use this phraseology:

"Paraparam Flight Service, Charlie Alfa Alfa".

The AFIS will come back to you with *"Charlie Alfa Alfa, Paraparam Flight Service".*

Now that you know the Flight Service Specialist is sitting in the tower, pencil in hand, ready to add you to the aerodrome's operations, continue with your callsign, aircraft type, position, intentions and POB.

"Charlie Alfa Alfa, Cessna 152 at the aero club shortly to taxi to operate northern end of Kapiti Island, training 30 minutes, 2 POB."

The AFIS will then give you the runway in use, wind, any pertinent operational issues (eg, birds), QNH and any significant traffic. Your reply should acknowledge the conditions and traffic, and read back the QNH.

"Charlie Alfa Alfa, taxiing to run-up area, copy conditions and traffic, 1013".

When You're Ready

Don't establish communications until you're all but ready. The AFIS aims to give you the most up-to-date traffic and conditions it can; and these could be five minutes or more out of date if you then have an extended run-up or preparation time. Remember the information you provide the AFIS is used to advise other traffic and should be timely and clear.

Let's Not Repeat Ourselves

Paraparaumu can be a busy place, especially at the weekends when glider and powered general aviation movements can be up in the hundreds.

> *. . . you, the pilot, retain 100 percent responsibility for where you put the aircraft . . .*

> *We're only ever going to be as good as the information we get in.*

If you've just heard an aircraft establish communications with the AFIS and you know the QNH, conditions and traffic, you can cut down on the radio traffic with:

"Charlie Alfa Alfa, Cessna 152 at the aeroclub, copy traffic and conditions, taxiing 16 seal to operate northern end of Kapiti Island, training 30 minutes, 2 POB, 1013". If you don't acknowledge the QNH and mention the traffic and conditions, the AFIS will be obliged to repeat it all to you. This applies equally to your position reports when joining the aerodrome, and entering or transiting the MBZ.

If however, you are joining and have not heard the traffic and conditions, give a general intention on first contact, such as *'joining'*; and once the AFIS has given you the available detail, include your specific intentions in your reply:

"Joining, downwind 16, number 2, traffic in sight, Charlie Alfa Alfa."

While You're Here . . .

If you're remaining in the circuit, you can now address your calls to *"Paraparam"*, not *"Paraparaumu Flight Service"*. The AFIS now knows your aircraft type, so you can simply say:

"Charlie Alfa Alfa downwind grass 34, touch and go", rather than *"Charlie Alfa Alfa, Cessna 152, downwind grass 34, touch and go."*

It's helpful to state where in the downwind leg you are. If you say *'mid-downwind grass'*, the Flight Service Specialist immediately knows where to look. Alternatively use *'early-downwind'* or *'late-downwind'*. There's no need to report in multiple locations around the circuit. A single downwind call is enough.

Once You're Not . . .

If you have left the aerodrome and are established in a training zone within the MBZ, you need no longer direct your calls to the AFIS, and should refer instead to *'Paraparam traffic* or *Otaki traffic'* etc. Yes, you are still on the same frequency as the AFIS (118.3), and they will be listening out, but they are unlikely to respond.

Is that Vacate or Operate?

If your plan is to track out of the MBZ, use the word 'vacate' when giving your intentions. If you're at Paraparaumu, intending to operate within the MBZ, use the word *'operate'*, and be clear about where you plan to go, such as *'northern end of Kapiti Island'*.

As Airways AFIS specialist Troy Atkins says:

"We're only ever going to be as good as the information we get in."

Say Again Words Slowly

Bear in mind, your radio calls are no longer heading into the ether. They are being jotted down by a real person, with a pencil. Aircraft are noisy and there's often a lot going on. When you're on the radio, speak more slowly and clearly than usual. The AFIS equipment does include a 'repeat last transmission' button, which allows the Flight Service Specialists to have another go at working out what you said, but only until your transmission is overwritten by the next one.

Departing IFR?

Departing IFR at an aerodrome with an AFIS is a little different as you are talking to control via an intermediary. At Paraparaumu, establish communications with the AFIS, and then request clearance as you usually would. It assists the AFIS if you give your intended departure procedure, such as visual departure 16 or visual departure to intercept RNAV SID 16 etc. The AFIS will then give you the nominated runway and conditions and tell you to *'standby for clearance'*. They will talk to Wellington Control, and then give you your clearance. Once you have read it back, the AFIS will say *'Charlie Alfa Alfa, read back correct, clearance not valid, remain outside of controlled airspace, report ready'*. This does not mean your clearance is cancelled; just that it has not yet been validated. When you have reported ready, the AFIS will contact Wellington Control again to validate your clearance and will say *'Charlie Alfa Alfa, your clearance is now valid (details)'*.

Get to Know the AFIS

Anything new can be daunting, but Paraparaumu's AFIS has been installed to improve safety and make things better for you. Get to know the team and what they can do for you. Tower visits are very welcome (just call first). ■

The Right Bits

Last year, a Part 145 organisation sourced a set of helicopter rotor blades through a parts broker in the USA – it looked to be a good deal, as the blades had a good number of hours life left on them, and the price was very reasonable.

The blades were received and placed in storage, and later in the year, were fitted to a helicopter on which one blade had deteriorated beyond repairable limits. While the helicopter maintenance records were being updated, a discrepancy was noted in the blade part numbers, and further investigation found that the part numbers applied only to blades manufactured for military use. The blades were promptly removed and quarantined, and a replacement set was fitted to the helicopter. A CA005D Defect report was raised, and the Part 145 organisation carried out an internal investigation, which resulted in some changes to its acquisition procedures.

Although the suspect blades had been accompanied by an FAA Form 8130-3 *Airworthiness Approval Tag* (an 'Authorized Release Certificate' under the FAA system) that correctly listed the blade part and serial numbers, some discrepancies were noted with the issue process. Additionally, during the purchase negotiations, photographs of the blades were supplied to the purchaser, and these showed the blades as green in colour. On receipt, however, they were found to have been painted grey. The painting had been carried out by an FAA-approved repair station, at the request of the parts supplier, but the repair station had not noted the implications of the colour change.

This particular manufacturer produces both military and civil blade variants, and to avoid confusion, military blades are always green and civil blades grey. Although the blade variants are otherwise physically indistinguishable from each other, the use of the military blades on civil aircraft is not permitted. The Form 8130-3 could not, therefore, have been issued legally.

In this case, the price of the rotor blades, compared with their service life remaining, was disproportionately low, and should have raised suspicions at an earlier stage. A classic case of the old adage, 'if something appears too good to be true, then it probably is'.

This is just one aspect of the aircraft parts supply business, in which there are many pitfalls for the unwary. Advisory Circular (AC) 00-1 *Acceptability of parts* provides guidance for showing compliance with Part 21, Subpart K, and Part 43, Subpart B relating to the use of acceptable parts on type certificated aircraft.

Be suspicious of any part that is not accompanied by the right documentation, or where supplied documentation contains discrepancies. This applies whether the part has been sourced internationally, or within New Zealand. Quarantine it until its provenance can be established beyond doubt, backed up by supporting documentation. Class it as a "suspected unapproved part" until its acceptability is determined – if assistance is required, contact the CAA (email info@caa.govt.nz), or submit a

Photo: ©istock.com/sndrk

CA005D Defect Report (available on the CAA web site, www.caa.govt.nz). See also AC00-2 *Storage and distribution of aeronautical supplies*, especially the quarantine store section.

Counterfeit parts also sometimes find their way into the system – these are parts manufactured by a non-approved firm or individual and represented as the genuine article, often down to realistic data plates and serial numbers. Unapproved surplus military stock is sometimes marketed as 'genuine' parts, usually with forged documentation, and this can make determining acceptability a very difficult exercise. Time-expired parts are sometimes found back in the aviation system, having been refinished or otherwise treated to look like new, and also usually supplied with forged documentation.

An extreme case of counterfeit parts was found during the investigation of a Robinson R22 helicopter accident some years ago. A tail rotor blade separated in flight, resulting in a loss of control and ensuing ground impact that killed both occupants. The tail rotor was found to be a non-standard part that had been fabricated from accident-damaged blades in the USA, and imported into New Zealand. To all appearances, the tail rotor blades were genuine, and this appeared to be backed up by the entries in the logbooks of the helicopter on which they had previously been fitted.

The workmanship and materials used in the remanufacture were severely substandard, and readily detectable once the blades were opened up – but in their 'as presented' state, they were indistinguishable from genuine blades.

A strong suggestion to maintenance providers and operators: when a time-expired part is removed from an aircraft, and there is no provision for overhauling or restoring that part to 'zero time', render it completely unserviceable so that there is no possibility of its being reused either deliberately or inadvertently. The same applies to critical parts such as rotor hubs that have been involved in an accident. Judicious use of a cutting blade and the separate disposal of the resulting pieces and the data plates is one means of avoiding the reappearance of a part (or a copy with the original data plate) at a later date.

Not only engineers, but also aircraft owners and operators, maintenance controllers, and stores personnel should be aware of the possible pitfalls that can be encountered when purchasing aircraft parts, particularly from overseas. Owners and operators should consult their maintenance provider before purchasing any parts, as it is the maintainer who takes the responsibility when fitting the parts. Advisory Circulars AC00-1, AC21-6 *Identification of products and parts – identification information, provision, and replacement* and AC00-5 *Parts Documentation – CAA Form One – Authorised Release Certificate*, all available on the CAA web site, give a great deal of valuable information on the subject. FAA Order 8130.21G *Procedures for Completion and Use of the Authorized Release Certificate, FAA Form 8130-3, Airworthiness Approval Tag*, is essential reading for those involved in sourcing parts from the USA, and is available on the FAA web site, www.faa.gov.

The FAA has a Suspected Unapproved Parts programme, details of which can be found on the FAA web site, www.faa.gov/aircraft/safety/programs/sups/upn. Although the CAA does not have a similar programme at present, we request that any New Zealand cases of suspected unapproved parts be notified to CAA so that an investigation can be undertaken. Use either an email to info@caa.govt.nz or Form CA005D to make the notification. ■

Helicopter Survey Helps

An aerial survey of Christchurch by helicopter is helping GNS scientists to find new faults and to better map those already known to exist. This will help in the planning and rebuilding of Christchurch.

GNS Science have conducted two geophysical surveys since the February 22 Christchurch earthquake. A gravity survey has been conducted on the ground, and a magnetic survey was conducted from the air by Central South Island Helicopters, in their MD520 Notar. A third geophysical survey, looking at seismic data, has been completed onshore by Canterbury University and the University of Calgary, and offshore by NIWA.

GNS Science Project Leader, Dr Vaughan Stagpoole says the purpose of this research is to understand the geological history of the area, and interpret what the future geological hazards could be.

"A sensor attached to the helicopter measures the earth's magnetic field, and the magnetic properties of the rock beneath the helicopter. The sensor is placed at the end of a long pole, to keep it as far away from the metal in the helicopter as possible, because this has its own magnetic signature. Grid lines, 400 metres apart, are then flown to record the data.

"The operator worked very closely with the Tower at Christchurch International Airport, reporting his movements and intentions when beginning and ending each survey line. It was a very slick operation. CSI helicopters knew where the helicopter was at all times, so they knew how the survey was progressing. They were always in contact with the pilot, and could call him back to base if there was high sun spot activity, or a magnetic storm, that would compromise the measurements," says Dr Stagpoole.

The information gathered during the aerial magnetic survey will be combined with the seismic and gravity survey information, as well as a detailed analysis of all aftershocks. Manager of the Natural Hazards Research Platform, Kelvin Berryman, says it is important that data from the earthquakes and the three different geophysical techniques – seismic, gravity, and magnetics – are taken as a whole.

Dr Berryman says that even though the findings are preliminary, they confirm there is a complex arrangement of faults in the bedrock under Canterbury and offshore under Pegasus Bay. This work is being carried out under contract to the Canterbury Earthquake Recovery Authority and the Ministry of Civil Defence and Emergency Management. Both organisations will use the data to help with planning and rebuilding decisions.

Geophysical aerial surveys involve the systematic collection of data, using sensing equipment attached to an aeroplane or a helicopter. The information can then be used in the fields of earth science, mineral and energy exploration, archaeology, and engineering. Information on land stability, soil structures, and the existence of subterranean water, can help with land and water resource management, and new mineral resources can be uncovered using this technology.

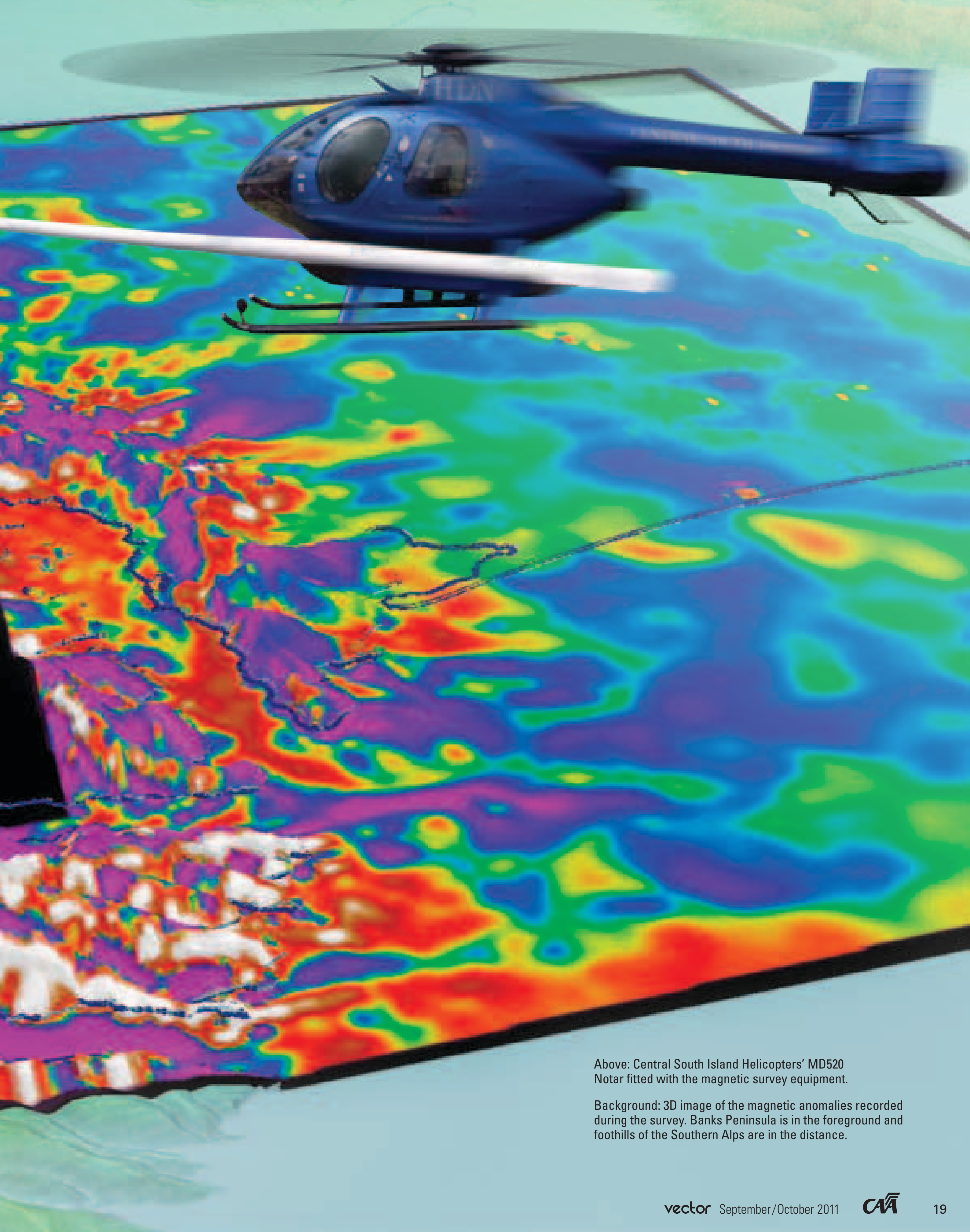
For safety reasons, the Christchurch aerial survey was conducted at 1000 feet AGL. This is considerably higher than most aerial survey work, which can be carried out as low as 150 feet AGL. Aerial surveys are considered a bona fide purpose to fly below the minimum heights for VFR flight (rule 91.311).

It can be unnerving for the general public to see an aircraft operating at such a low height, and it can also cause significant disruption to animals or stock in the survey area. For this reason, the CAA asks operators who conduct low level survey work to notify residents of their intentions, usually through an advertisement in the local paper.

Manager Fixed Wing, Merv Falconer says, "As part of a no surprises approach, we also ask operators to notify the local council, the police, and the CAA. We pass this information on to the CAA Aviation Safety Adviser in the area, to ensure they know what is happening in their patch – should they be contacted by members of the public with concerns about the operation".

More information on the geophysical surveys conducted by GNS Science can be found in a video on YouTube, www.youtube.com – search for 'Christchurch Geophysical Survey', or by visiting the GNS web site, www.gns.cri.nz. ■

Christchurch



Above: Central South Island Helicopters' MD520 Notar fitted with the magnetic survey equipment.

Background: 3D image of the magnetic anomalies recorded during the survey. Banks Peninsula is in the foreground and foothills of the Southern Alps are in the distance.

Fuel Contamination – a Bug in the System

Clear and bright? That's how we like our fuel samples to look, but what if they don't?

All pilots are familiar with the pre-flight ritual of taking a sample from each of the aircraft fuel-drain points, and checking for water and other contaminants. Finding a few globules of water is common in both avgas and Jet A-1, but the interaction between water and each fuel type is quite different. The presence of water in jet fuel can lead to an insidious invasion, which is the theme of this article.

Jet A-1 is a kerosene-type fuel, and it is capable of holding water in very fine suspension – so fine that it cannot be detected with the naked eye. The only reliable means of detection is by the use of a test kit, such as the Shell water-detection capsules – a measured amount of fuel is drawn through the capsule by a syringe, and the presence of water above a certain level will cause a colour change in the treated filter paper in the capsule.

In normal operations, a small amount of suspended water (less than 30 parts per million) can be expected. Although it can form very fine ice crystals at low temperatures, these are generally returned to the liquid state in the oil/fuel heat exchangers in many engine fuel systems. Fuel system icing inhibitors (FSII) are also an effective preventative measure, lowering the freezing point of suspended water.

Over time, especially if the fuel is left standing, suspended water can gradually precipitate out and pool at the low point(s) in the tank. This accumulation of water is added to by the condensation of atmospheric water in the tank, as air is drawn in through the tank vents by normal daily warming and overnight cooling. The air in a partially-filled tank will expand and contract with temperature change, causing the tank to 'breathe', and the condensed water will continue to accumulate unless drained.

Not only is there water in the air, but also minute dust particles and viable spores of many bacteria, yeasts and fungi. Of particular significance is the fungus *hormoconis resinae*, formerly known as *cladosporium resinae*, and sometimes referred to as fuel fungus or diesel bug. This little mutt can thrive in the water/fuel interface at the bottom of the tank, feeding on the hydrocarbons in the actual fuel. It grows as a filamentous, black/brown substance, and produces further spores after about three weeks. The biomass can entrap water droplets, making them less liable to flow to the tank low point.

Left unchecked, the resultant growth can have a number of effects. In extreme cases, its physical bulk can clog fuel filters and interfere with fuel quantity sensing systems.

Its metabolism produces more water plus other waste products, which can have adverse effects on the aircraft structure and on fuel system components. In particular, aluminium can be directly attacked, and rubber seals can be degraded by these fungal by-products. One extreme case involved the replacement of a lower wing skin on a BAe 146, so severe was the corrosion caused by long-term fungal contamination in the fuel tank.

Sometimes *hormoconis resinae* can be 'aided and abetted' by other micro-organisms. High on the list of these are *yarrowia lipolytica*, a single-cell yeast, and *pseudomonas aeruginosa*, a simple bacterium. These and other organisms produce additional biomass, which can exacerbate the clogging of filters and fuel lines. Different combinations may have different appearances, but the resulting deposits are generally dark-coloured and have a slimy look and feel. It is worth noting at this point that avgas is toxic to these organisms, so for avgas users, the problem does not arise.

In many cases, evidence of an infestation is detected only when a fuel filter is changed, and the contamination is noticed. In a severe case, the reason for the fuel filter change may have been a filter bypass warning. Where a filter bypass indicator is incorporated in the fuel system – and the indicators are commonly either a cockpit caution light and/or a 'pop-out' button on the filter housing – the aircraft maintenance manual will include actions to be taken in the event of an activation.

If microbiological contamination is suspected, positive confirmation may require a laboratory test. In this, your fuel supplier will be able to provide guidance as to suitable test facilities, and how to go about transporting samples. Filters should not be allowed to dry out before being enclosed in several layers of polythene bags, then wrapped in aluminium foil. Details such as aircraft identification, filter brand and part number, time in service, whether the detection was on a routine inspection or by an abnormal indication, and whether this is a single event, should be forwarded with the filter.

For fuel remaining in the tank, several different test kits are available, and again, your fuel supplier will be able to advise on these. Some require an incubation time before a result is evident, and others can give an almost instant 'go' or 'no-go' result. Where heavy contamination is evident, the fuel tank interior will require a physical clean before being refilled. A biocide would normally be mixed with the fuel at this time. A light contamination would require only the addition of a biocide in the correct proportions. Biocide addition is normally a one-off treatment these days.

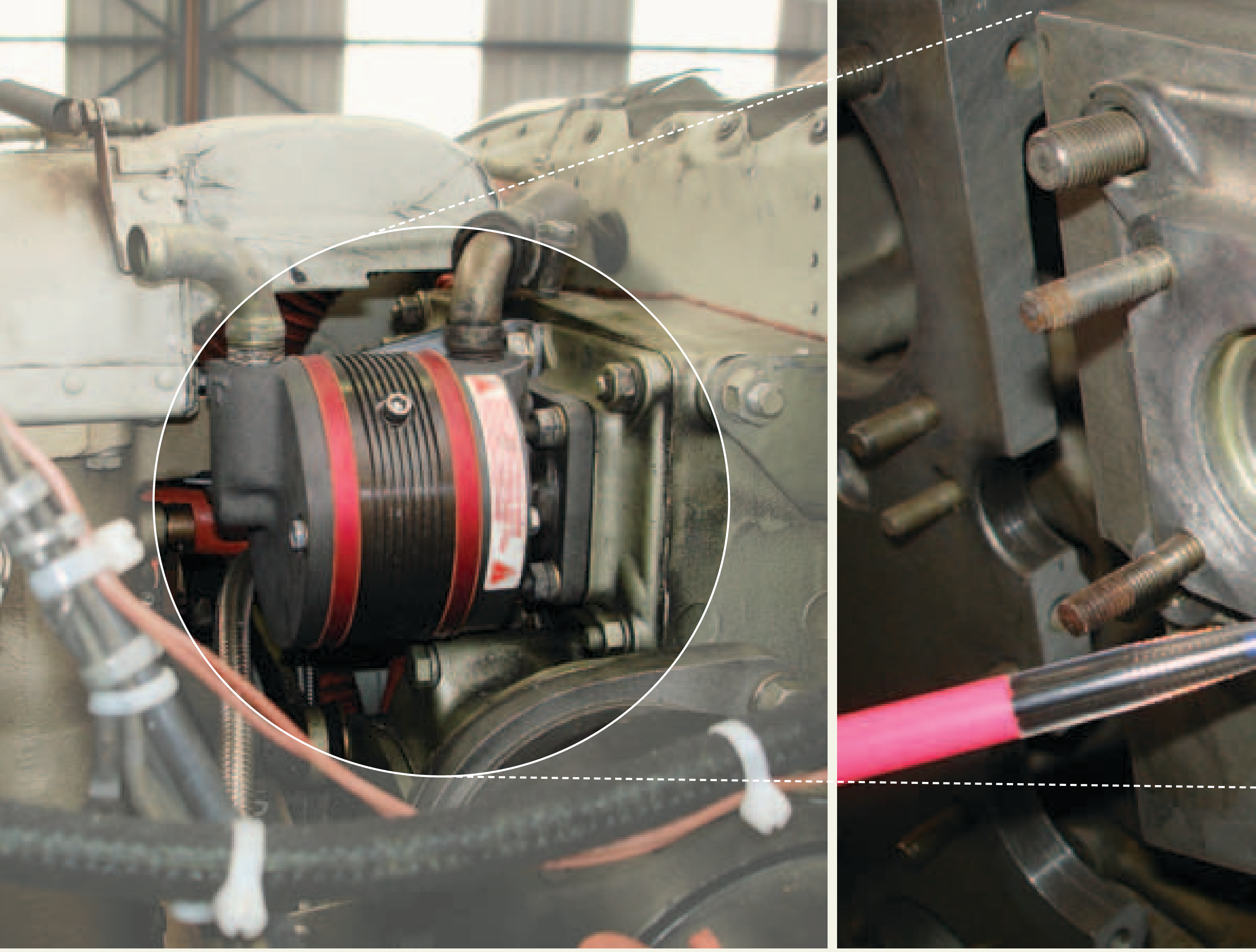
Operators who routinely use a FSII will generally not encounter microbiological contamination, as the FSII in current use, di-ethylene glycol monomethyl ether (di-EGME), has biostatic properties. That is, it inhibits the growth of micro-organisms in the fuel tank. It is normally added during refuelling to ensure even distribution, in a concentration of 0.10 to 0.15 per cent by volume.

Prevention is Better than Cure

Fuel suppliers have in place extensive processes and procedures to ensure that the fuel supplied is free from contamination. This involves good housekeeping practices as well as filtration at various points in the supply chain.

Good housekeeping is the key to fuel quality – microbes cannot grow in the absence of water. Aircraft fuel tanks should be kept as full as possible to minimise condensation, and regular water drain checks should be carried out. For helicopter and light aeroplane operators using drums and jerrycans, normal precautions apply, and great care should be taken with fuel filtration. We heard of an operator who removed in-line fuel filters from their refuelling rig because they kept getting blocked! ■

Liquid base photo: ©istock.com/kedsanee



Don't DIY

The great Kiwi number 8 wire, 'can-do', DIY mentality is good for house renovations, broken lawnmowers, and high performance go-karts – just leave it out of the aircraft maintenance.

Recently, a light aircraft owner decided to save a bit on maintenance by removing a vacuum pump after it failed in flight, causing the Artificial Horizon (AH) to wander. The owner booked the aircraft in for maintenance, confident that he could legally fly it to the maintenance base without an AH on a private VFR flight.

To save himself some labour costs, he removed the dry vacuum pump himself before departing.

He took off, raised the flaps and then adjusted the power setting. Immediately he noted the prop rpm response was not normal and the engine sounded noisy. He decided to carry out an emergency landing onto a nearby airfield. It was a wise choice.

The owner's DIY efforts had left the aircraft bleeding oil, and the engine had been moments away from seizing completely.

The dry vacuum pump effectively blanks an oil pressure port that provides lubrication to an oil-lubricated vacuum pump, on certain aircraft. These are known as 'wet' pumps. The differences would be obvious to any appropriately rated Licensed Aircraft Maintenance Engineer (LAME). By removing the 'dry' pump, the owner had left the oil free to exit the engine at speed. Had a LAME removed the pump, they would have immediately installed a blank to the 'wet' pump port to keep the oil where it needed to be.

Fortunately, the owner was able to land safely, without injuring himself or further damaging the aircraft.

His maintenance bill though, had just gone through the roof.

Aircraft maintenance is a skill that takes years to hone. Non-LAMEs who wish to carry out maintenance must be under the direct physical supervision of an appropriately qualified person. This event serves to illustrate why.

Learn more:

There is a very narrow and clearly defined list of maintenance tasks that can be carried out by a pilot rated on the aircraft type who has been trained in the task by a type-rated LAME. View Part 43 *General Maintenance Rule*, Appendix A – *Maintenance performed by a person under Rule 43.51(b)*, on the CAA web site. ■

Part 115 Seminars

Part 115 *Adventure Aviation – Certification and Operations* is coming soon.

The CAA is running three seminars in mid to late October to help prepare operators for these new requirements.

Seminars will be held in Queenstown, Hamilton and Wellington, and will cover the history of the rule Part and why it has been developed, the practical steps to certification, and operating in the Part 115 environment.

Watch the CAA web site for details:

www.caa.govt.nz

Alcohol Issues

There's now a new organisation to help pilots and air traffic controllers affected by alcohol or other drug issues return to work sooner than they otherwise could.

The Human Intervention and Motivation Study (HIMS) NZ programme has been established by representatives from Airways, Air New Zealand, the Federation of Air New Zealand Pilots, the RNZAF and the NZALPA, with the CAA supporting the initiative.

HIMS NZ is a substance abuse management programme that coordinates the identification, treatment, and return to work, of the affected aviators. Like its US counterpart, HIMS, on which it is modelled, this programme works on a proven sequence of steps. These are: peer identification, intervention, evaluation and diagnosis, treatment and recertification of the dependency problem, with special emphasis on aftercare and monitoring of those affected.

The US experience shows that affected aviators may enter the programme in one of three ways: self-enrolment, enrolment due to intervention by fellow workers who support the HIMS programme, or enrolment due to the encouragement of HIMS-trained personnel.

The programme can be accessed thorough the HIMS NZ web site, www.hims.org.nz.

More information on alcohol and other chemical dependencies is available on the CAA web site, www.caa.govt.nz, "Medical – Medical Information Sheets". ■

Listening Component for **English Testing**

A new listening component will be added to the Formal Language Evaluation (FLE) testing in English Language Proficiency (ELP), from 1 November 2011.

Aviation Services Limited (ASL), the company that conducts aviation examinations for the CAA, has applied to the International Civil Aviation Organisation (ICAO) for an endorsement of their FLE testing. The new listening component has been included in the semi-direct component of the FLE test to meet the standards required for achieving ICAO endorsement.

Candidates will now be required to listen to a recording of a typical exchange between the tower and a pilot, and will then be asked a few related questions to ensure they can apply their listening and comprehension skills in the workplace.

This new requirement does not apply to the Level 6 proficiency demonstration.

Civil Aviation Rules 61.11 *Application and qualification* and 65.11 *Application for licences and ratings* require pilots and air traffic controllers to have sufficient ability in speaking, understanding and communicating in English. These Rules and the related Advisory Circulars (AC 61.1 *Pilot Licences and Ratings – General* and AC 65.1 *Air Traffic Service Personnel Licences and Ratings – General*) can be viewed on the CAA web site, www.caa.govt.nz, under the "Rules" and "Advisory Circulars" links respectively.

Since March 2008, all new Pilot, Air Traffic Control, and Flight Service Operator licences issued have required an ELP credit. For more information, see the article on *English Language Proficiency*, page 8, *Vector*, September/October 2007, also available on the CAA web site, under "A to Z Topics".

More information is also available on the ASL web site, www.asltasman.com, and from ASL Operations Support Manager Kathryn Molloy, email: kathryn.molloy@aspeq.com. ■

Temporary **MOAs**

The New Zealand Army will be operating unmanned aerial systems (UAS), and conducting live firing with high explosives and mortars, in South Canterbury and North Otago in October and November 2011. Four temporary military operating areas have been established to contain this activity, the largest of which stretches from the surface to 13000 feet AMSL and encompasses a significant area of mountain range. It is essential that pilots read *AIP Supplement* 160/11, effective 20 October 2011 to find out exactly where and when this activity will take place, and which IFR routes and procedures will be affected by it. ■

ACAG **Elections**

The Aviation Community Advisory Group (ACAG) elections will be held on 24 November 2011, 1.30 pm, at the Wellington International Airport Conference Centre.

The ACAG is a body of members drawn from the wider aviation community that provides a forum for the exchange of high-level information with the CAA on rules issues. For more information, contact ACAG Deputy Chairperson Paul Drake, email: avpad@clear.net.nz, or visit the CAA web site, www.caa.govt.nz, "Rules Development – Aviation Community Advisory Group (ACAG)". ■

Operations **Overseas?**

A number of industry participants, especially General Aviation operators, have aircraft engaged in operations within other states (domestic offshore operations). The CAA is currently developing its approach to the regulatory oversight of these operations. For updates, see the CAA web site, www.caa.govt.nz/policy. ■

How to Get Aviation Publications

AIP New Zealand

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

Pilot and Aircraft Logbooks

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

Rules, Advisory Circulars (ACs), Airworthiness Directives

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

Planning an Aviation Event?

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

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

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

CAA Cut-off Date	*Airways Cut-off Date*	*Effective Date*
3 Oct 2011	10 Oct 2011	15 Dec 2011
17 Oct 2011	24 Oct 2011	12 Jan 2012
14 Nov 2011	21 Nov 2011	9 Feb 2012

See **www.caa.govt.nz/aip** to view the *AIP* cut-off dates for the year 2012.

Aviation Safety Advisers

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

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

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

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

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

Aviation Safety & Security Concerns

Available office hours (voicemail after hours).

0508 4 SAFETY
(0508 472 338)
isi@caa.govt.nz

For all aviation-related safety and security concerns

Accident Notification

24-hour 7-day toll-free telephone

0508 ACCIDENT
(0508 222 433)
www.caa.govt.nz/report

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

Accident Briefs

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

ZK-EGT NZ Aerospace FU24-950

Date and Time:	20-Apr-10 at 14:25
Location:	Waipukurau
POB:	1
Injuries (Serious):	1
Damage:	Destroyed
Nature of flight:	Agricultural
Pilot Licence:	CPL (Aeroplane)
Age:	57 yrs
Flying Hours (Total):	6700
Flying Hours (on Type):	6000
Last 90 Days:	62

Soon after takeoff, the aircraft failed to clear rising terrain off the end of the airstrip. In the resulting collision with the ground, the aircraft was destroyed and the pilot was seriously injured. The high ambient temperature, a tail wind component, and a moderate load caused the aircraft to become overloaded for the prevailing conditions with a consequent lack of performance.

CAA Occurrence Ref 10/1492

ZK-NMG Stoddard-Hamilton Glastar

Date and Time:	25-Oct-10 at 14:45
Location:	Patearoa
POB:	1
Injuries:	0
Damage:	Substantial
Nature of flight:	Private Other
Pilot Licence:	PPL (Aeroplane)
Age:	56 yrs
Flying Hours (Total):	441
Flying Hours (on Type):	291
Last 90 Days:	16

The takeoff was aborted after the aircraft did not accelerate as expected. The aircraft failed to stop before overrunning the strip, coming to rest in a creek.

CAA Occurrence Ref 10/4109

ZK-CJN Alpi Aviation Pioneer 300

Date and Time:	12-Nov-10 at 17:15
Location:	Masterton
POB:	1
Injuries:	0
Nature of flight:	Private Other
Age:	67 yrs
Flying Hours (Total):	970
Flying Hours (on Type):	850
Last 90 Days:	100

The aircraft had been on a local flight of the area. During the landing, with a crosswind from the left, the aircraft bounced off a small bump. The wind caught the aircraft and it landed heavily suffering damage to the nose wheel.

CAA Occurrence Ref 10/4497

ZK-EMN NZ Aerospace FU24-954

Date and Time:	1-Dec-10 at 13:15
Location:	Wairuna
POB:	1
Injuries:	0
Damage:	Substantial
Nature of flight:	Agricultural
Pilot Licence:	CPL (Aeroplane)
Age:	60 yrs
Flying Hours (Total):	25000
Flying Hours (on Type):	16500
Last 90 Days:	116

During agricultural operations, the pilot commenced a takeoff when the loader vehicle had not cleared the loading area. In the resulting collision, the aircraft was substantially damaged, the loader vehicle sustained minor damage, but the crews were not injured.

CAA Occurrence Ref 10/4920

ZK-HOI Robinson R22 Beta

Date and Time:	8-Mar-11 at 8:00
Location:	Fiordland
POB:	2
Injuries (Minor):	1
Damage:	Destroyed
Nature of flight:	Private Other
Pilot Licence:	PPL (Helicopter)
Age:	64 yrs
Flying Hours (Total):	366
Flying Hours (on Type):	363
Last 90 Days:	20

The day before the accident, the pilot had flown from Northland to Fiordland with one passenger. They planned to visit a friend and to enjoy some mountain flying in the local area. On the morning of the accident, they had been out flying for around an hour and a half with another helicopter. The other helicopter successfully landed in a large bush clearing to fill out venison paper work. As the pilot of the second helicopter was making very slow OGE orbits deciding where to land, tail rotor effectiveness was lost. The helicopter began to yaw to the right, and the situation rapidly developed to where it was irrecoverable with the altitude remaining. The helicopter continued to yaw before striking the ground causing significant damage. The passenger received minor injuries in the accident. The first helicopter flew the occupants out to a nearby road.

CAA Occurrence Ref 11/940

GA Defects

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

Key to abbreviations:

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

Cessna 172K

Cylinder

Part Model:	Titan
Part Manufacturer:	Engine Component Inv (ECi)
Part Number:	AEL 65102-NST04
ATA Chapter:	8500
TSI hours:	47
TSO hours:	1332
TTIS hours:	3289

As the pilot rotated the aircraft on takeoff, the engine lost a substantial amount of power. The pilot was able to abort the takeoff and stop on the remaining runway available. Maintenance investigation found that the number four cylinder head had separated from the cylinder barrel. DCA/LYC/218 had been carried out 47 hours prior to the cylinder head failure. CAANZ notes that the cylinder assembly was an ECi Titan part number AEL65102 and by serial number falls into the Group A range of serial numbers which is subject to a 50-hour inspection as required by DCA/LYC/218. This is the second reported occurrence during 2010 where a cylinder head has failed within the 50-hour inspection period required by the AD.

For Group A cylinders, aircraft operators and maintainers may consider it prudent to carry out the AD at more frequent intervals than specified by the AD. From discussions with ECi, a cylinder rework project has been developed by the company and is currently waiting on FAA approval. When approval is given, a Service Instruction will be issued by ECi.

CAA Occurrence Ref 10/3756

Cessna 172S

Static line

Part Model:	172S
ATA Chapter:	3411

While on an IFR training flight, the crew noticed that the altimeter would stick for a few seconds and then jump to a different value. The aircraft was in IMC with the cloud base close to the approach minima. Christchurch Control gave altitude callouts during the descent and approach. The aircraft cleared the cloud just above the approach minima. Maintenance investigation found that the static line was partially blocked by an unidentified insect. The blockage was cleared and the aircraft returned to service. The training organisation has highlighted the occurrence to other pilots by an article in their safety newsletter.

CAA Occurrence Ref 11/594

Diamond DA 42

Gasket

ATA Chapter:	7300

During approach to the aerodrome, a developing fuel imbalance was noted. The right tank was indicating 2 USG less than the left, with a fuel smell apparent. This imbalance did not appear to increase during the remainder of the flight, however when taxiing in, the imbalance was showing as 4 USG. After arriving on the gate, fuel was seen to be running from beneath the right engine onto the main landing gear. A fire extinguisher was retrieved from the apron, the fuel selectors turned to off, and engineers advised in an effort to stop the fuel spill.

The right hand engine cowls were removed and an inspection carried out on the engine fuel lines. It was found that the seal at the banjo coupling on the fuel return line had cracked. The seal was replaced and an engine ground run carried out to leak test the fuel system. No leaks were evident. The engine, engine compartment, and cowls were cleaned and the right hand landing gear leg was washed down. The engine cowls were re-fitted and the aircraft was returned to service.

CAA Occurrence Ref 10/3540

Fletcher FU24-950M

Elevator counterweight

Part Model:	242666
ATA Chapter:	2731

The pilot had, for some time, reported vibration in the stabilator control circuit. On an engineering inspection the bolts associated with the clamps surrounding the stabilator counterweight were found loose and had been fretting. This led to the fatigue of one bolt, with another about to fail. The failure was attributed to a previous maintenance organisation where the clamp and bolts had been replaced with the wrong parts. The correct parts were installed, the stabilator was refitted, and a successful test flight was conducted.

CAA Occurrence Ref 10/3151

Pacific Aerospace Cresco 08-600

Part Manufacturer:	PAC
ATA Chapter:	5530
TSI hours:	150
TTIS cycles:	98018
TTIS hours:	8312

During routine maintenance the forward fin attachment fitting was found to have loose fasteners attached to a fuselage bulkhead. Repairs included work in accordance with Service Bulletin 037 using alternate fasteners and adhesives. It was suspected that the hopper lid deflector was causing fin buffeting and has been removed.

CAA Occurrence Ref 10/5011

Free

Aviation Safety Coordinator Course

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

If your organisation operates commuter services, general aviation scenic operations, flight training, sport aviation, or engineering, you need an Aviation Safety Coordinator.

Attend this free two-day course to train new aviation safety coordinators, and to refresh and re-inspire existing ones –

» you will get a comprehensive safety manual;

» access to all of the latest CAA safety resources and support; and

» lunch is provided (accommodation, transport and other meals are not provided).

Christchurch

Thursday 27 and Friday 28 October 2011

Sudima Hotel
Christchurch Airport
cnr Memorial Ave and Orchard Rd
Christchurch

Check the CAA web site, www.caa.govt.nz, under "Seminars and Courses" for an enrolment form and further information. Places are limited and they fill up quickly, so enrol early.

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