March / April 2009

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Classic Fighters 2009

Agricultural Aircraft Safety Review

Thunderstorms and Weather Radar

Exam Cheating

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CIVIL AVIATION AUTHORITY OF NEW ZEALAND

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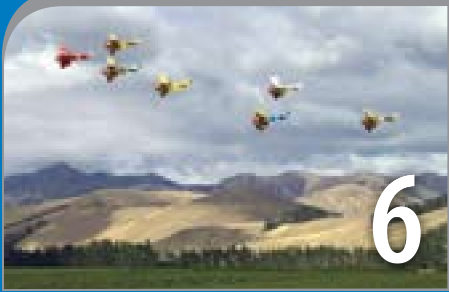
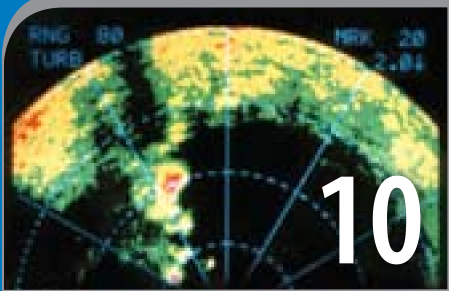
Agricultural Aircraft Safety Review Completed

The CAA has completed a wide-ranging review of agricultural aircraft safety. The Agricultural Aircraft Safety Review, published late last year, has identified a significant increase in undercarriage defects since the introduction of Part 137 *Agricultural Aircraft Operations*.



Classic Fighters 2009

A significant number of aircraft will be converging on the Marlborough area over the Easter period. *AIP Supplements* 52/09 and 53/09 cover procedures for operating in the Woodbourne and Omaka area from 9 to 13 April 2009. Here is a summary of their key points.



Thunderstorms and Weather Radar

Although most aircraft flying IFR are equipped with weather radar, flight into active Cbs still occurs, often resulting in damage. A thorough understanding of your particular weather radar system, and correct interpretation of the display, will help to reduce this possibility.

Exam Cheating

There is zero tolerance for cheating in aviation exams. Those caught cheating may have to pay infringement fines, and can also be barred from sitting further exams for 12 months. Basically, anyone cheating jeopardizes their career in aviation.

In this issue...

Cover: Seven Fokker DR.1 Triplane replicas in formation at Classic Fighters 2007. It is thought to be the first time that seven of these aircraft had been seen in the air together since WW1. Photo courtesy of Gavin Conroy.

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Pacific Aerospace Cresco 8-600

Agricultural Aircraft Safety Review

A CAA study confirms long-held concerns about the safety of fixed-wing agricultural aircraft.

The Agricultural Aviation Safety Review, published late last year, was initiated in response to concerns from both the CAA and industry. Its purpose was to authenticate anecdotal stories as far as possible, and to consider the design, continuing airworthiness, and maintenance practices and techniques for New Zealand's agricultural fixed-wing aircraft.

The Review followed a report commissioned by the CAA to focus in particular on the overloading of agricultural fixed-wing aircraft. This has been permitted since 1994 with the introduction of Part 137 *Agricultural Aircraft Operations*. The initial report was carried out by aviation industry consultant Bernie Lewis. It found that allowing overloading, without compensatory measures, affected safety.

In 2007, the Review was initiated to examine the issue in more depth. It included an examination of all Fletcher defects (651 since 1970), all Cresco defects (358 since 1991), and all 200-odd defects from the other fixed-wing agricultural aircraft in the New Zealand fleet. It found there had been a significant increase in undercarriage defects after 1994, when Part 137 *Agricultural Aircraft Operations* became effective.

General Manager General Aviation John Lanham says that finding did not come as a surprise.

"This was the gut feeling held by both the CAA and the agricultural aviation industry, but now we have been able to quantify it."

The Review also found there was a further increase in undercarriage defects after 2001. It draws a link between these defects and the steady increase in agricultural aircraft refitted with turbine engines.

In February this year, the CAA met with senior members of the Agricultural Aviation Association (AAA) and the President of the Aviation Industry Association (AIA) to discuss the issues confirmed by the Review.

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Air Tractor AT-4028

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John Lanham says the industry leaders have accepted its contents with only minor exceptions.

"To that end, the CAA will now be looking in detail at the conclusions reached in the Review and developing a detailed action plan. It is expected that significant changes will be required in the fixed-wing agricultural industry.

"A priority will be to address the overloading issue. The rule provision allowing loading beyond maximum certified takeoff weight (MCTOW) will not be maintained. Operations will be required to be carried out at MCTOW unless the operator's aircraft has been approved for operations at higher weight by the manufacturer or other certificated design organisation.

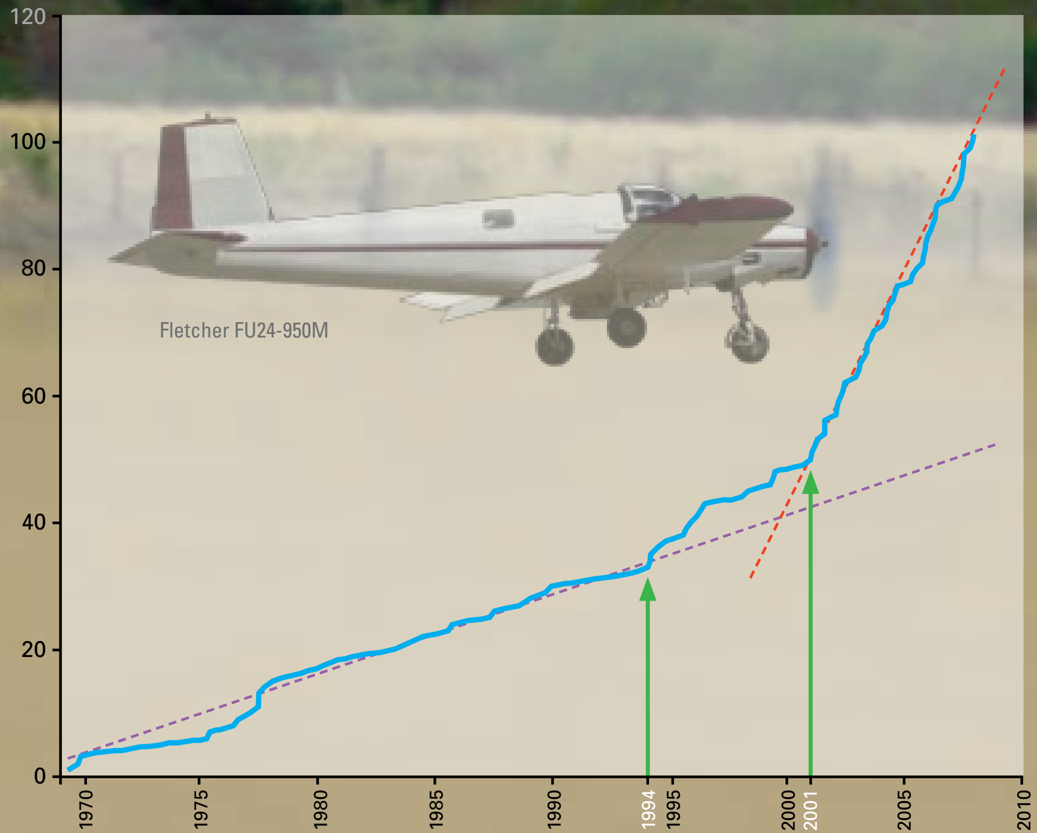
"This option would invoke the Supplemental Type Certificate process and would also require supplements to the aircraft Flight Manual so that any pilot operating the aircraft would be able to assess performance considerations at the higher weight. The CAA will also consider, with industry, the possibility of introducing a finite life-of-type for the re-engined turbine Fletchers," John said.

"The study has also highlighted limitations in the CAA's own database, which shall be addressed. Similarly, the CAA will be reviewing its internal process for considering and approving changes to an aircraft's configuration.

"The AAA and the CAA generally agree that this is perhaps the most significant and wide-ranging review of the agricultural aviation industry in the past 50 years. There are a great many issues to be considered and the CAA will be leading the industry through that process over the coming months," John said.

The Agricultural Aircraft Safety Review is available on the CAA web site, www.caa.govt.nz, see "General Aviation". ■

FU24 Series Landing Gear Occurrences



Part 137 *Agricultural Aircraft Operations* became effective in 1994. It incorporated a provision from a United States Civil Aeronautics Manual (CAM 8) that allowed agricultural aircraft to operate about 30 percent above their maximum certified takeoff weight (MCTOW). However, the New Zealand rule did not require the associated compensatory precautions for aircraft operations that were found in CAM 8.

The graph shows an increase in defects after 1994 when the overload provisions were introduced. There is an even more significant increase in undercarriage defects after 2001. The CAA's Agricultural Aircraft Safety Review concludes the latter increase is due to the increased power of the turbine engines refitted to many Fletcher aircraft, which enabled them to lift significantly heavier loads than the original piston-engine aircraft. This significantly accelerated the resulting wear and loading on the landing gear.

Classic Fighters 2009

The Classic Fighters airshow will be one of the biggest aviation events of the year and a significant number of aircraft will be converging on the Marlborough area over the Easter period.

Pre-flight Preparation and Publications

There are a number of documents you need to plan a safe flight to and from Classic Fighters.

» *AIP New Zealand, Vol 4.*

» Visual Navigation Charts covering your proposed route and all alternative routes.

» *AIP Supplements* 52/09 and 53/09.

On the day of your flight, also remember to obtain weather information and NOTAMs.

AIP Supplements 52/09 and 53/09

These Supplements cover procedures for operating in the Woodbourne and Omaka area from 9 to 13 April 2009. They are available online, www.aip.net.nz.

The importance of having read and understood them cannot be overstressed. Make sure you fully understand the procedures in use. As you work your way through them, have a copy of the VNC to hand with your planned route drawn on it. Ideally, you should be able to follow them from memory, but have them available for quick reference in the cockpit anyway.

Can I Fly Into Omaka?

Yes! Visiting aircraft are invited to attend the airshow at Omaka subject to the following restrictions.

Practice Days

On Thursday 9 and Friday 10 April, Omaka aerodrome will be partially closed during practice sessions from 1000 until 1600 NZST (except for specifically authorised aircraft). During this period, there will be two practice slots in the first and the third quarter of each hour (ie, 1000 until 1015, and 1030 until 1045). There will be two arrival or departure slots in the second and last quarter of each hour (ie, 1015 until 1030, and 1045 until 1100) available for general use. If a practice runs over the stated times, other aircraft may be asked to hold accordingly.

Airshow Days

On Saturday 11 and Sunday 12 April, Omaka aerodrome will be **closed to all aircraft** from 1000 until 1600 NZST.

Temporary Restricted Area

NZR694 will cover the Maxwell Sector and the Fairhall Sector within the Woodbourne CTR/D, from the surface to 4500 feet amsl.

It will be active daily from 0630 to 1830, 9 to 12 April 2009 and 0630 to 1200, Monday 13 April 2009 NZST. When active, the airspace within NZR694 becomes Class G (uncontrolled).

Pilots operating in NZR694 must listen to the Woodbourne ATIS on 126.05 MHz prior to entering, turn on landing and/or anti-collision lights if fitted, operate their transponder on Mode A or C, maintain a listening watch, and make radio calls to Omaka Traffic on 126.1 MHz, and make sure they stay within the boundary of NZR694 unless they have a clearance to enter the CTR from Woodbourne Tower. Specific authorisation must be given by the Administering Authority to operate NORDO or without a transponder in NZR694.

Runways

When NZR694 is active, the Omaka Runway 07 and 12 circuits are right hand. During the period 9 to 13 April 2009, Runway 01/19 will be closed.

Parking and Fuel

Aircraft involved in the airshow, or invited to attend, will be marshalled to their respective parking slots. All itinerant aircraft will be marshalled to the closed off section of Runway 01/19 which is southwest of Runway 12/30. Avgas will be supplied on request from a mobile Air BP tanker at Omaka.

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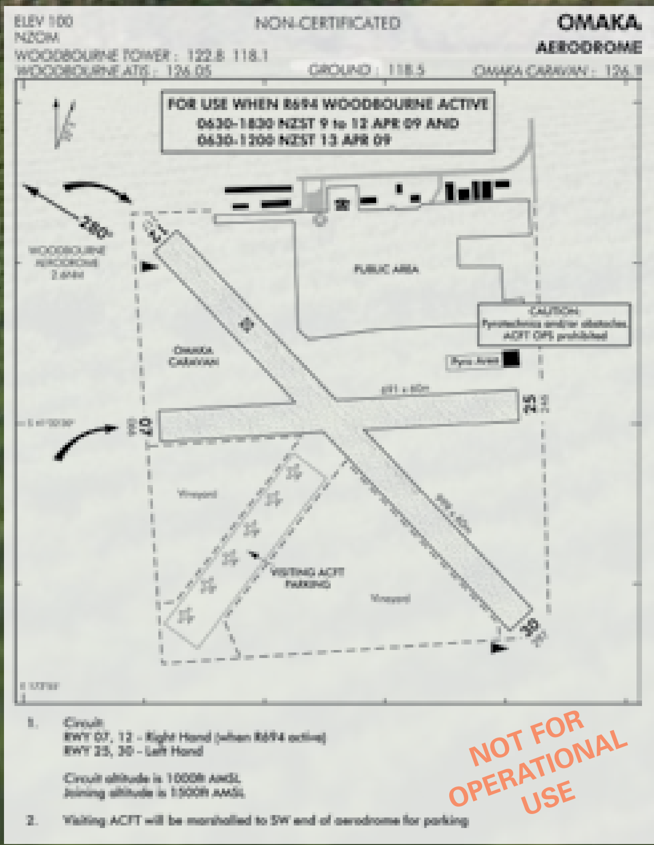

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Woodbourne Aerodrome

Parking and Fuel

Aircraft wishing to park at Woodbourne are to contact the aerodrome operator for details. Avgas will be available on request from Air BP during the following periods only: Friday 10 April, 0800 - 1700 NZST and Monday 13 April, 0800 - 1700 NZST. Jet A-1 will be available on request from Air BP as per *AIP New Zealand*.

Anyone planning to fly in and out of Woodbourne on Saturday or Sunday will need to carry enough fuel for their flight to Woodbourne, 30 minutes holding fuel, plus the fuel required for their return flight home, with legal reserves. The alternatives are to arrive a day earlier on Friday, depart a day later on Monday, or park at Omaka.

Air Traffic Services

A mobile caravan will coordinate all airshow activity at Omaka. "Omaka Caravan" will transmit on 126.1 MHz, with "Ground" on 118.5 MHz. Omaka Caravan will not provide traffic information or any other form of air traffic service.

Air Traffic Services will continue to be provided by Woodbourne Tower (122.8 MHz) within the remainder of the Woodbourne CTR/D. Pilots must listen to the ATIS broadcast on 126.05 MHz prior to contacting Woodbourne Tower for entry into the CTR/D, and prior to departure.

Woodbourne CTR/D

All operations within the Woodbourne CTR/D (excluding NZR694) are subject to ATC approval. If safety or weather dictates, operations within the Woodbourne CTR/D may be suspended.

The Control Zone is Transponder Mandatory and aircraft without operable transponders will not be approved. Landing and/or anti-collision lights must be turned on. Pilots reporting inbound should expect to receive traffic information on the aircraft immediately ahead of them.

Holding

If the forecast or actual weather for Woodbourne falls below a cloud base of 2000 feet or visibility of 15 km, pilots can anticipate delays. There may be a requirement to remain outside controlled airspace, especially near Rarangi. All aircraft must carry enough fuel to hold for 30 minutes and then divert to an alternative aerodrome. If you are required to hold, orbits should be left hand, with your lights on.

VFR to Omaka

You must plan to fly one of the Omaka VFR arrival procedures published in *AIP New Zealand, Vol 4*. Subject to weather, there should be no delay for aircraft requesting a clearance to transit the CTR/D and enter NZR694 via a published Omaka arrival procedure. Other procedures may be accommodated if weather, traffic, and safety permits.

VFR to Woodbourne

There are two VFR arrival procedures published in *AIP Supplement* 53/09 for Woodbourne, the River Arrival for Runway 06, and the Coast Arrival for Runway 24. Study them carefully.

Subject to weather, there should be no delay for aircraft requesting a clearance to enter via these arrival procedures.

A landing sequence number will be given when you join the circuit. Simultaneous parallel operations are permitted on grass and sealed Runways 06/24 for aircraft less than 5700 kg.

Light aircraft can expect to land on the grass. The sealed runway will be used for heavy or high performance aircraft, and others on request. If landing on the sealed runway, light aircraft must vacate to the south and request a clearance to cross both the sealed and the grass runways.

Procedures for Arriving IFR Aircraft

IFR aircraft will only be accepted for the RNAV (GNSS) RWY 24 approach or the VOR/DME RWY 06 approach (circling as required). Aircraft requiring a VOR/DME or VOR approach for Runway 24 will require prior approval from Woodbourne Tower. This is because the missed approach for the VOR/DME RWY 24 enters NZR694 and will not normally be available unless the Omaka Airshow is suspended. Approval will not be withheld if the actual and forecast weather conditions are better than a cloud base of 2000 feet and visibility of 8 km.

Departing Omaka VFR

Expect to fly one of the Omaka VFR departure procedures published in *AIP New Zealand, Vol 4*. If you need to enter the Woodbourne CTR/D, obtain a clearance from Woodbourne Tower before takeoff.

Departing Woodbourne VFR

There are two VFR departure procedures published in *AIP Supplement* 53/09 for Woodbourne, the River Departure for Runway 24 and the Coast Departure for Runway 06.

Aircraft must report when clear of the Woodbourne CTR/D on 122.8 MHz.

Flight Plans

Woodbourne Tower will not accept flight plan requests or terminations. Flight plans are to be cancelled with the National Briefing Office (0800 626 756) after landing, or with Christchurch Information on 121.3 MHz.

When nominating a SARTIME, remember that you may have to hold, and take into account the time required to taxi to a parking position and make a phone call to the National Briefing Office. Flight plans should be filed with the National Briefing Office prior to departure.

Controlled VFR Requests

VFR pilots who intend requesting clearances to enter the Wellington CTA/C must comply with the following requirements:

- » If in uncontrolled airspace, requests must be made at least five minutes prior to the CTA/C boundary – contact Wellington Control on 122.3 MHz; or
- » If controlled VFR with Christchurch Control or Ohakea Control, advise your intentions to that sector;
- » Aircraft must have a serviceable Mode C transponder and your request should include a preferred altitude and route.

The availability of clearances will be subject to workload. This is dependent on weather conditions in the Cook Strait and Wellington areas. As this is a holiday weekend, airline schedules are different to normal. Clearances should **not** be requested between the hours of 0900 - 0930, 1400 - 1500 and 1600 - 1800 NZST.

If a controlled VFR clearance is critical, contact the ATS Supervisor at Christchurch for a time and route that will give the best chance of the request being met without undue delay.

Ensure you carry a current Visual Navigation Chart (VNC) for the area and familiarise yourself with the airspace boundaries, visual reporting points, and prominent geographical features on your planned route.

Time Pressure

When planning, build in a weather contingency. Make sure that your boss, and the owners of the aircraft you are flying, are okay if you don't get back on Monday or Tuesday due to weather. Think about back-up accommodation too.

Weather is not the only source of time pressure. Don't rely on being able to land and refuel without delay en-route – you may find yourself number ten at the pump, with an unplanned extra hour on the ground. On departure from Omaka or Woodbourne, there may be a long queue of aircraft, particularly if you intend to fly out after the airshow. Don't put yourself in a situation where a delay getting airborne will compromise a safe arrival at your destination. ECT in the Cook Strait area is 1815 NZST on 14 April.

Blenheim's Weather

Woodbourne and Omaka are situated in a unique micro-climate. The surrounding hills and ranges on either side of the Wairau Valley provide orographic protection from the weather and channel the surface wind as westerlies and easterlies. The prevailing wind direction is west or northwest. The surface wind, however, can be completely different at the two aerodromes. For example, a westerly wind can be reported at Woodbourne, but an easterly can be occurring at Omaka from the sea breeze.

In the valley system there can be considerable differences between upper-level winds and surface winds. For example, southerly airflows in Cook Strait tend to become light to moderate easterly conditions at Woodbourne and Omaka. During strong southerly flows, there is often a strong shear zone in Cloudy Bay at the edge of the strong southerly wind in the Straits.

Very low cloud can occur at Omaka and Woodbourne. The situation is most likely to occur when a broad northeast to east airflow originating from the subtropics advects warm moist air into the area. In these conditions, low stratus with a base of 300 to 600 feet with drizzle can occur.

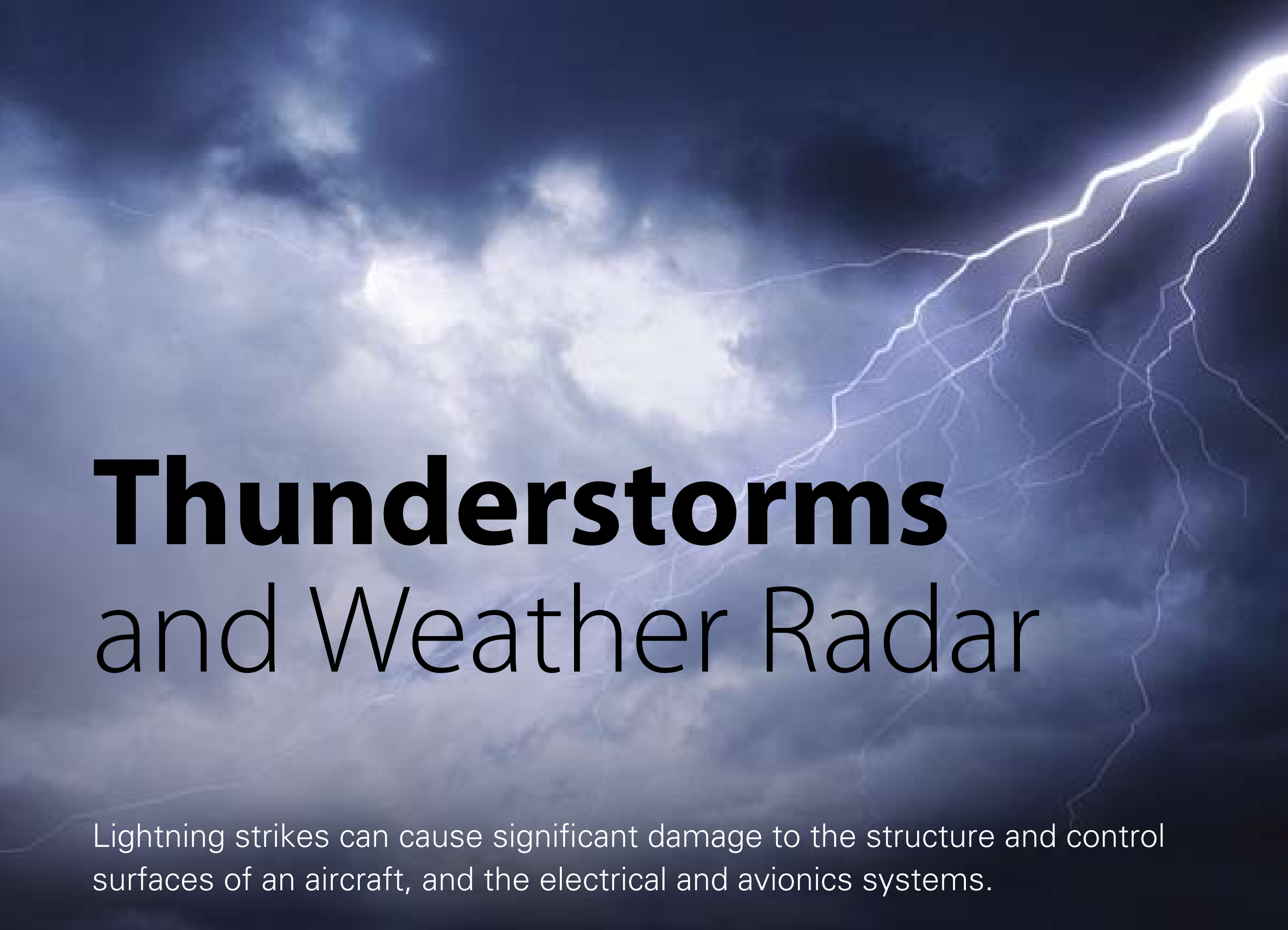
During moist south to southeasterly winds through Cook Strait, low stratus in the Straits will be advected to the north and northwest of the approach areas, and occasionally over Woodbourne and Omaka. At times this stratus remains as a cloud bank along the coast.

During moist airflows from the north, ahead of advancing cold fronts from the Tasman Sea, a low layer of stratus can develop. In these situations precipitation is normally present, with a lower cloud base about the hills to the north, and higher to the south over Omaka. At times, low cloud and rain that develops in the upper Wairau Valley and the Richmond Range will stay confined to the ranges, while Woodbourne and Omaka remain clear.

In general, the weather at Woodbourne and Omaka is better than in Cook Strait or the surrounding mountains. If you are able to fly VFR from your destination to Woodbourne, then a landing should not be a problem. Conversely, be aware that when you depart Woodbourne, the weather conditions may deteriorate as you leave the CTR/D.

Summary

Thorough preparation will enhance your flying experience, as well as making it safer and easier for you, your passengers and other pilots. In the air, use your passengers to help out. Brief them to point out all the aircraft they spot. Keep your head on a swivel, keep radio calls accurate and to the point, and follow all ATC instructions. See you there. ■



Thunderstorms and Weather Radar

Lightning strikes can cause significant damage to the structure and control surfaces of an aircraft, and the electrical and avionics systems.

Surprisingly, lightning strikes are often triggered by the aircraft itself. A study conducted by the NASA Storm Hazards Program in the 1980s showed that an aircraft flying into a strong electric field often triggers the lightning that strikes it. In the decaying stage of a thunderstorm, an extended anvil forms containing strong electric charges. This is the most likely place for an aircraft to trigger a strike, because a metal aircraft intensifies the cloud's electric field, becoming a likely source of lightning initiation.

An aircraft will attract lightning if it is not at a similar potential to the surrounding air mass (due to local charge build-ups). To minimise the potential of being struck, all aircraft parts should be properly bonded, and during your pre-flight make sure all static wicks are serviceable. This will create a low resistance path for lightning to exit the aircraft, preventing heat build-up and reducing the potential for damage.

The more frequently lightning flashes in a storm, the lower the probability of being struck if you fly into it. On the flip side, a higher flash rate means a greater potential for encountering severe turbulence, heavy rain, and hail in the storm.

The NASA research involved 1500 flights between 5000 feet and 40,000 feet. Most of the 714 strikes received occurred in light rain and light turbulence conditions. Lightning strikes were encountered at nearly all temperatures and altitudes – so there is no safe place to be in a thunderstorm.

The best policy is to avoid Cumulonimbus clouds (Cbs) like the plague, but by how much, and how do you find them?

Weather Radar

Airborne weather radar is an excellent tool for avoiding Cbs, however pilots must understand how the technology works, its limitations, how to use their system, and how to interpret the radar display, in order for weather radar to successfully keep them out of trouble.

Avoid Them

Put as much distance as practicable between you and active Cb cells. Avoid areas of red and magenta as these indicate intense rainfall and turbulence, generally associated with Cbs. If possible, a minimum of 5000 feet vertically and 20 NM laterally should be applied to reduce the chance of encountering severe turbulence. Frontal Cbs often form in a line. They are easier to divert around than convective Cbs, which are random in distribution and constantly moving and changing.

Determine a heading change that will allow you to bypass a Cb by a safe lateral distance. In some instances it may be possible to climb above one, but Cbs in New Zealand generally extend to FL250 (or higher in late summer around Auckland). Thunderstorms tend to travel in the direction indicated by the 10,000 foot wind. New cells generally form on the downwind side of a thunderstorm, and turbulence with be encountered in downwind eddies created by the storm obstructing the windflow. So it is safest to detour to the upwind side of a Cb.

How Does it Work?

Radar works on the premise that some of the energy in radio waves is reflected by the objects they strike. If you want to locate something and learn something about it, you can throw radio waves at it, then measure the strength of the energy that comes back and the amount of time it takes to return.

In the case of weather radar, the objects that reflect radio waves are precipitation droplets. Radar will detect rain, wet hail, ice crystals, dry hail, and dry snow – however, the last three will only give small reflections. Water particles are five times more reflective than ice particles of the same size. Radar echo returns are proportional to droplet size and intensity. Radar cannot detect clouds, fog, or wind, as the droplets are too small or don't exist. It cannot detect clear air turbulence or windshear, as there is no precipitation associated with these, except in a microburst.

Avoid areas of red and magenta.

Limitations

There are several limitations of weather radar, the most significant being attenuation. Dennis Newton describes the problem of attenuation in the book *Severe Weather Flying*.

> "Consider what happens as the radar antenna pulses and sends out a scouting party of skilled and dedicated photons to search for a storm. Let's suppose the scouts run into a really big one…some of them fortuitously run into water drops near the closest edge of the storm, and they dutifully rush back to report what they found. This results…in a paint on the screen of the leading edge of the storm at pretty much correct intensity.
>
> Meanwhile, however, some of the photons have made it farther into the storm before they hit anything. Now, in order to report their findings, they have to fight their way back out. Most of them make it, but some of them run into more drops before they get out and are bounced back in again. The ones that get out add thickness to the storm picture on the scope, but may or may not paint at the correct intensity. This process continues, with the return from deeper in the storm getting weaker and weaker.
>
> Now consider the really intrepid scouts who get deep into the storm and smack into Level 7 rain. 'Holy Kemo Sabe,' they think, 'this thing's deadly. We gotta get back and warn the boss!' But what happens when they try? Alas, they can't get out. They keep getting bounced back by other drops on the way…the hapless individual is the pilot who mindlessly believes the radar, because there is no paint at all from that distance into the storm or through it. That makes it look a whole lot thinner and a whole lot less intense than it really is."

Since the weather radar display depends on signal returns, heavy rain may conceal even worse weather behind it, and the aft part of a storm may be displayed as green (appearing as less threatening) or as a black radar shadow (implying no threat at all). Modern weather radars are able to apply a correction to a signal when it is suspected to have been attenuated. This reduces the phenomenon, but a black hole behind a red area should always be considered active.

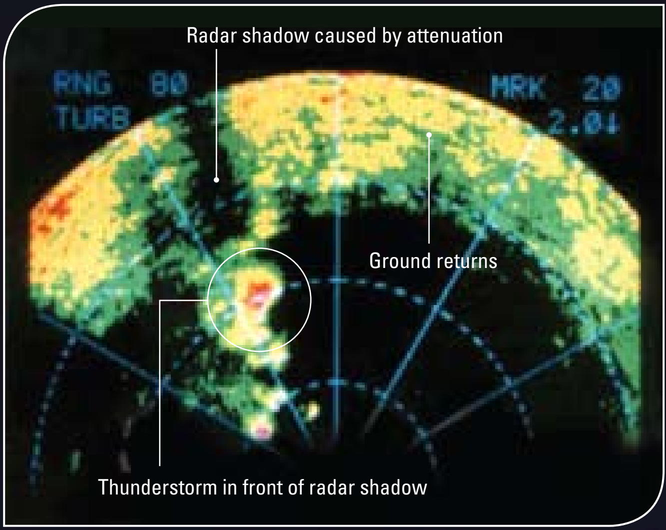


Photo courtesy of Honeywell ©

Antenna Tilt

Terrain will also reflect energy back to the antenna. The resulting ground clutter makes it more difficult to interpret weather radar, as weather echoes and ground clutter can be difficult to differentiate.

In August 2008, a Q300 was struck by lightning on climb out of Palmerston North. The aircraft entered a light hail shower and then received a strike to the nose area. No system malfunctions were experienced. The weather radar was on and adverse weather in the area was observed on the screen, but as the aircraft was still low, the crew stated they were uncertain if what they saw on the screen was actual weather or ground clutter off the ranges.

The key to determining weather echoes from ground clutter is antenna tilt.

Modern weather radars generally have flat antennae and use X-Band frequencies (8000 to 12,500 MHz). The antenna is swept left and right automatically. The tilt of the antenna up and down, however, can be controlled by the pilot. Zero tilt of the antenna equates to the longitudinal axis of the aircraft. With tilt set to zero, the attitude of the aircraft will determine whether the beam is pointing above, below, or straight ahead, of the aircraft. Some systems have an automatic attitude correction function.

Changing the tilt will change the shape and colour of ground clutter, eventually causing it to disappear. It is a good idea to have a small amount of ground return showing at the edge of the display. This shows the system is working, and allows radar shadows to be seen. If the tilt angle is too high or too low however, the radar beam will miss weather directly ahead of the aircraft. Ideally, the centre of the beam should be aligned with the flight path.

One degree of tilt up or down moves the beam centre 1000 feet up or down at a distance of 10 NM from the aircraft. Effective management of antenna tilt enables you to estimate the vertical extent of Cbs. The following formula can be used to determine the top of a Cb in height above or below the aircraft's altitude.

Distance of the weather (NM) x Tilt angle required for the weather to disappear from the display x 100.

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For example, a Cb disappearing at 50 NM with 1 degree of tilt down has a top located 5000 feet below the aircraft.

Most systems also have a Gain function. Temporarily selecting a lower Gain setting will allow more in-depth study of intense weather targets.

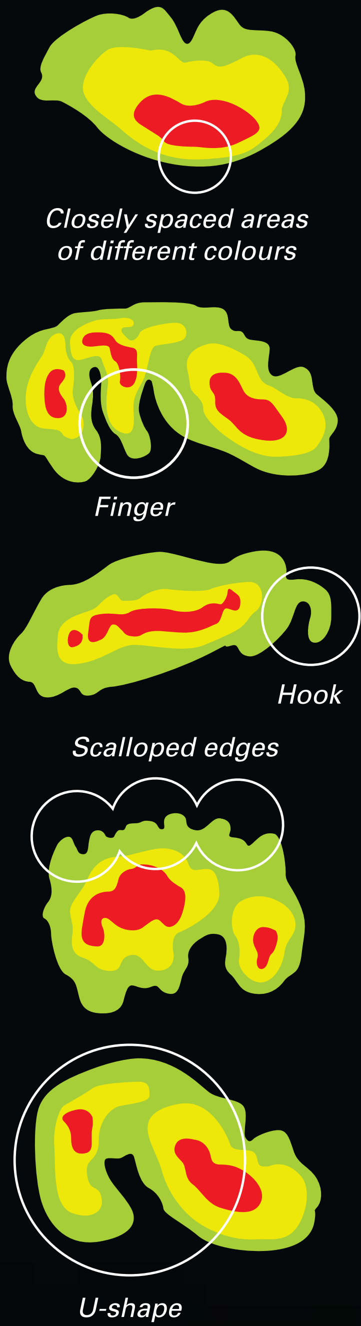
Antenna tilt should be adjusted throughout a flight, taking into account aircraft attitude, the expected weather, and the display range selected.

It is best practice to display longer ranges and periodically change to a lower range and tilt for a more in-depth look in front of the aircraft. This will give you time to evaluate weather changes. Thunderstorms grow rapidly and a course that is clear one minute may contain cells a few minutes later. Study both higher and lower range returns before deciding where to go.

Shapes painted on a radar screen are also an excellent indicator of severe weather. Fingers, hooks, u-shapes, scalloped edges, and fast changing shapes indicate areas to avoid. Closely spaced areas of different colours indicate highly turbulent zones.

Although most aircraft flying IFR are equipped with weather radar, flight into active Cbs still occurs, often resulting in damage. A thorough understanding of your particular weather radar system, and correct interpretation of the display, will help to reduce this possibility. Weather radar should never be used as a tool for penetrating severe weather, but as a means of avoiding active cells.

Shapes indicating adverse weather



Lightning Strikes in New Zealand

In the last 15 years there have been 25 lightning strikes in New Zealand with a severity classified as 'major'. Here are a couple:

Metro III – 5 May 1999

On approach to Wellington, the aircraft was struck by lightning and all electrical power was lost. The approach was discontinued and the aircraft climbed to where visual conditions could be maintained. Partial electrics were restored, but the left engine fire warning light illuminated. The crew shut the engine down and diverted to Woodbourne.

SAAB SF340A – 6 Oct 2000

On descent towards Nelson the crew were cleared for the VOR/DME 02 approach via the arc. They declined this approach due to thunderstorm activity showing on the radar. The strike occurred at 9700 feet as they were cleared to track direct to the Nelson VOR for the VOR/DME ALFA approach. Both generators tripped off line, the EFIS displays and autopilot failed. All systems were restored once the generators were reset. The crew operated on standby instruments during the 90 seconds it took to restore generator power. The standby compass was found to be 40 degrees out due to the strike magnetising the nose gear leg. The rudder, hydraulic pipe fairings, and aircraft skin, were also significantly damaged. ■

Photo courtesy of Honeywell ©

Exam **Cheating**

Your aviation theory exam date is looming large. You are not as confident as you should be. But you are determined to pass the exam. So what do you do?

For reasons best known to them, some students who were in the above situation, decided that they would cheat in the exams to make sure they achieved the passing grade. Now, having been caught cheating, they are hopefully ruing their decision.

For not only have they received substantial fines, they have also been debarred by the Director of Civil Aviation from sitting further exams for periods up to 12 months. Their decision to cheat has cost them both time and money, and has the possibility of jeopardising their careers in aviation.

To emphasise a point in an attempt to stamp out this type of behaviour, the Director is likely to take firm action against anyone caught cheating in an exam. And rightly so. If a person sitting an aviation theory exam gets assistance from an unauthorised source or another person, their marks do not necessarily reflect their actual competence in, or knowledge of, that particular topic. This undermines the integrity of the examination system and poses a serious safety risk not only to the travelling public, but also to other aviators who could be sharing the same airspace.

Aviation Services Limited (ASL), who administer the aviation theory exams under delegation from the Director, have already modified and intensified pre-exam processes to make the examinations more robust and tamper-proof. They have also set in place improved measures to identify and tackle methods of cheating. According to ASL Service Delivery Manager, Jakki Brodie, ASL is determined to ensure that the message about the zero tolerance policy for cheating becomes well known.

Although only a small minority of students cheat, it is important in the interests of safety to highlight the serious consequences that are likely to follow if aviation students are foolish enough to cheat in exams.

For further information, see rule 61.19 *Written examinations – unauthorised conduct*, on the CAA web site, www.caa.govt.nz. ■

CAA Approves **Biofuel Flight**

Air New Zealand's successful biofuel test flight owes its success to the collaborative approach taken by the key partners: Air New Zealand; Rolls-Royce (the engine manufacturer); Boeing (the manufacturer of the 747-400 used in the test flight); UOP (who refined the jatropha-based fuel); and the CAA (who approved the test flight).

In February 2008 Air New Zealand came to the CAA to present their proposal to use a mixture of renewable bio-derived jet fuel and Jet A-1 in an operational flight test.

Air New Zealand's long-term goal is to become the world's most environmentally sustainable airline. Chief Executive Officer, Rob Fyfe, said, "Firstly, (the bio-matter) must be environmentally sustainable and not compete with existing food stocks. Secondly, the fuel must be at least as good as the product we use today. Finally, it should be significantly cheaper than existing fuel supplies and be readily available."

The fuel used for the test flight was a 50:50 blend of standard Jet A-1 fuel and synthetic paraffinic kerosene derived from jatropha oil. Laboratory tests showed the final blend met the stringent technical requirements for fuels used in civil aircraft.

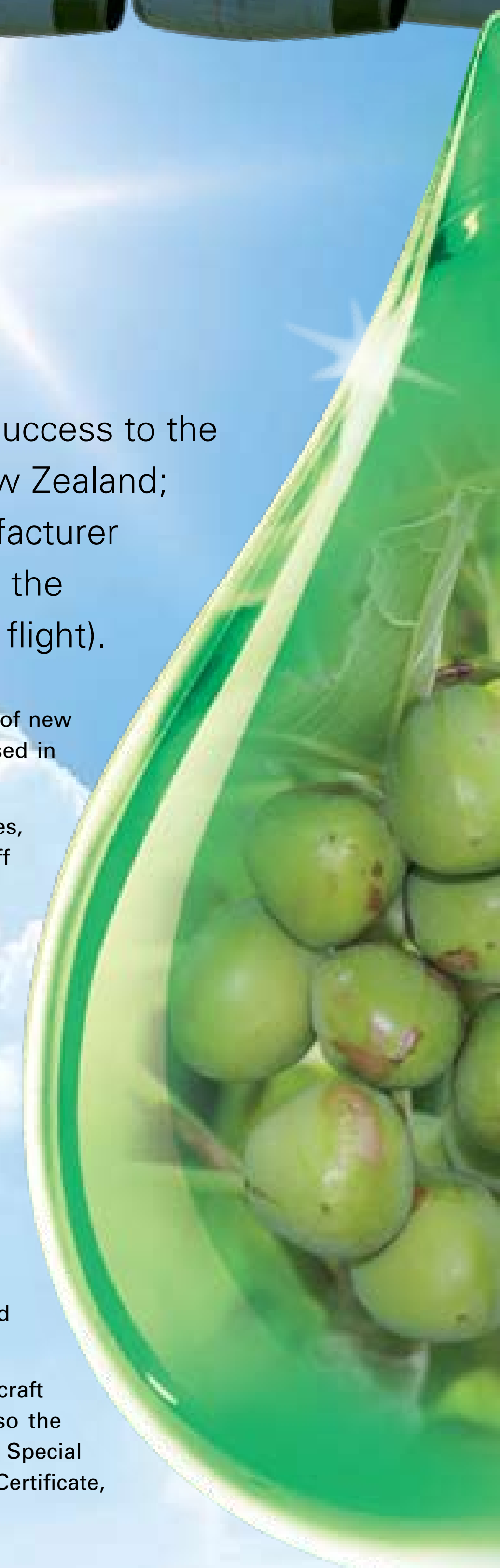
Steve Douglas, Director of Civil Aviation, said, "The CAA's primary role was to ensure that safety was not compromised at any stage. We worked alongside Air New Zealand and their partners to ensure the application of new technology in this case could be assessed in a controlled and safe environment."

Mark Hughes, General Manager Airlines, said, "The technical skills of our staff were essential to the success of this initiative. The CAA worked closely with Air New Zealand to ensure that a rigorous process was followed to address risk, and then monitored the actual execution of the flight."

The Process

The Manager of Aircraft Certification, Geoff Connor, managed the project for the CAA. "Members of all three Airline Group units, namely Airline Flight Operations, Airline Maintenance, and Aircraft Certification, were involved in the assessment of the technical data."

With one engine using biofuel, the aircraft would not meet its type specification, so the aircraft was required to operate under a Special Category – Experimental Airworthiness Certificate,

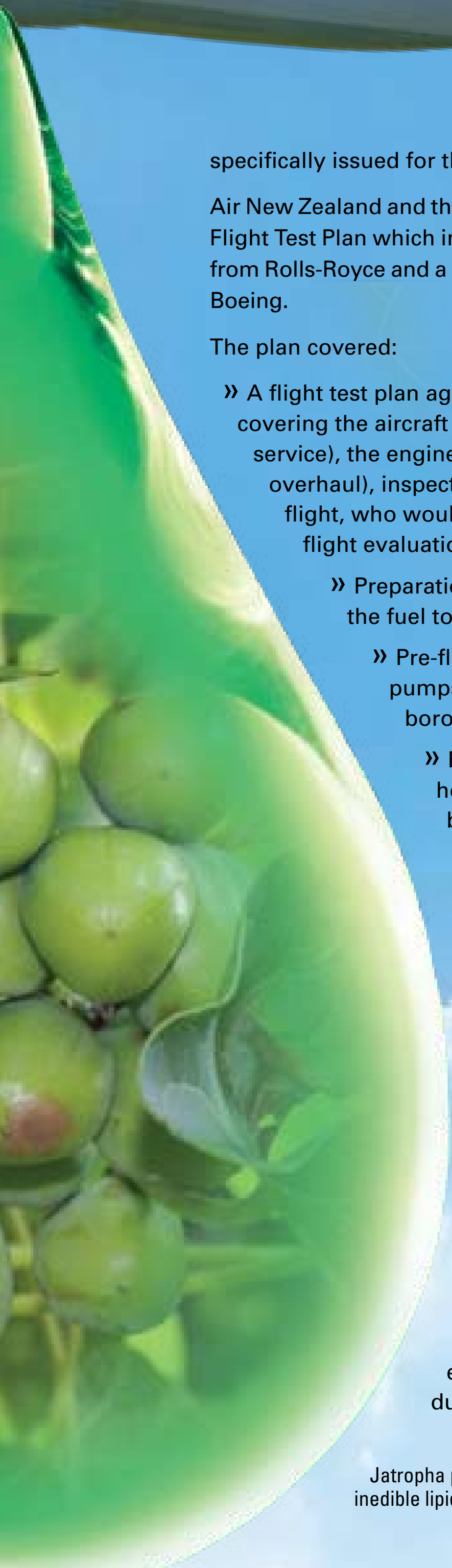


specifically issued for the purposes of testing and research.

Air New Zealand and the manufacturers developed a Biofuel Flight Test Plan which included a Letter of Technical Support from Rolls-Royce and a Letter of No Technical Objection from Boeing.

The plan covered:

- A flight test plan agreed between all the parties covering the aircraft to be used (one just removed from service), the engine to be used (high-hours nearing overhaul), inspections of the engine, the length of the flight, who would be on the flight, and the post-flight evaluation;
- Preparation of the fuel and tanker to deliver the fuel to the aircraft;
- Pre-flight engine tests including which pumps and filters would be used, and boroscope inspections of the engine;
- Fuel loading procedures showing how the aircraft fuel tank would be filled;
- Ground runs to ensure the engine was operating within parameters before the test flight;
- Pre-flight procedures to ensure the correct tank to engine configuration and requirements for monitoring engine parameters;
- In-flight testing to show equivalent engine performance and operability during flight;
- De-fuelling procedure;
- Return to service plan for the engine and the aircraft, and
- Hazard identification, assessment and mitigation – for example if the engine fails to relight during the test flight.



Jatropha plants produce seeds that contain inedible lipid oil that is used to produce fuel.

The blended fuel met the essential requirement of being a "drop-in" fuel – its properties were virtually indistinguishable from conventional Jet A-1 fuel. With the fuel meeting this standard and the flight test plan approved, the Experimental Certificate of Airworthiness was issued on 24 December 2008.

Test Flight

CAA Airline Flight Operations Inspector, Bryan Lockie, participated in the simulator session the day before the flight, as well as being on the test flight on 30 December 2008. "The simulator session proved that the procedures Air New Zealand proposed were appropriate and we were able to approve the flight for the following day."

The test flight checked that the engine performed within parameters, and covered a variety of operations including a full power takeoff, engine shutdowns and restarts in flight, auto throttle use, and spool up time from flight idle to full power.

In addition, the engine suction fuel-flow at altitude was confirmed by turning off the appropriate fuel tank pumps, and a simulated approach at 10,000 feet – with a go-around at 7000 feet – was accomplished.

At the end of the flight, after all engines were shut-down, the test engine was re-started, all parameters confirmed, then shut- down again.

"We were all happy with the flight, it proved very successful," said Bryan Lockie.

Outcome

The results from the flight are still being evaluated but initial indications are that the use of biofuel was a success. Considerable work will still need to be done with aircraft and engine manufacturers before biofuel can be approved for regular line operations. This is an important first step and the CAA is committed to working with Air New Zealand and other airlines in advancing this process. ■

A AS350 collective lock

B MD500 collective friction lock

C BK117 collective lock

D R22 cyclic friction lock

E AS350 cyclic friction lock

F R22 collective lock

See page 25 for two examples

POB Ø

On average, a helicopter crashes with no one on board once a year in New Zealand.

"How can this happen?" I hear you ask, when all helicopter flight manuals state, "Minimum Crew: 1 Pilot" (or 2, as the case may be).

The engines in turbine helicopters often require overhaul based on the number of cycles or 'starts' they have had, not just their time in service. Shutting down and restarting increases the maintenance frequency. For this reason, turbine helicopters are often left running when on the ground for a short period of time.

The pilots of piston engine helicopters do not have the same excuse for leaving their aircraft running. Instead, it is purely a way to save time.

Many pilots believe it can be done safely, and after doing it for years with no consequences it becomes a habit. Complacency pushes aside the very real possibility of the helicopter taking off without them.

There are several reasons for a pilot to leave a helicopter while it is running. To escort passengers to and from the machine safely (if there are no ground staff available to do this), to refuel a turbine helicopter, or agricultural pilots will often get out to speak to the farmer they are working for about the job.

In deciding whether to leave a helicopter running, the pilot must weigh up several things. The gain of reduced engine cycles (for turbine helicopters), or other extenuating circumstances, against the length of time they anticipate being on the ground, the fuel that will use, and the risk of leaving the helicopter pilotless. For example, a good case can be made for leaving a helicopter running while landing on a mountain with tourists. The risk of the weather changing quickly, or not being able start the helicopter again in such a hostile environment, may outweigh the risk of leaving the helicopter while it is running.

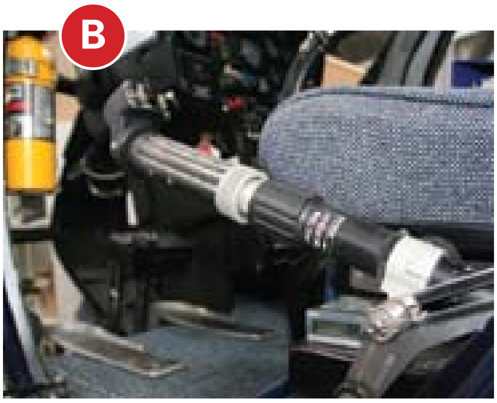
Pilots and operators should have strict safety procedures for leaving a helicopter unattended. These should cover the positioning of locks and frictions, RPM, limitations on wind direction and strength, instructions to be given to passengers who are left in the helicopter, the centre of gravity position and the effect on this when a pilot disembarks, and the distance a pilot is allowed to be away from the aircraft. The helicopter should be in continuous view of the pilot, there should be no extraneous people in the area who could walk into it, and dual controls should not to be fitted in front of a passenger.

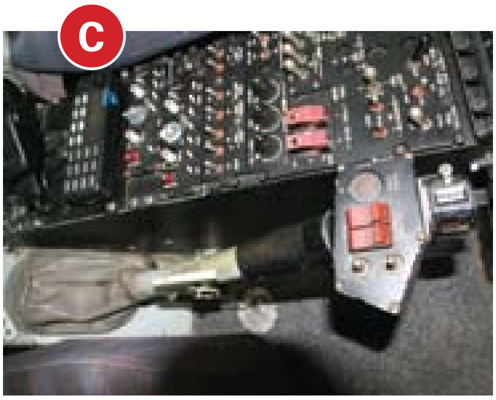
Remember – uncommanded fly-aways do happen, and you are taking a calculated risk every time you decide to leave a helicopter when it is running.

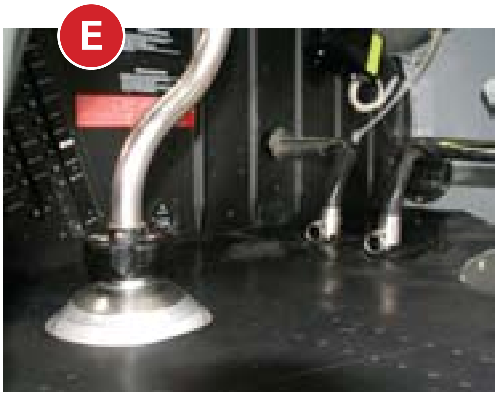
How Does it Happen?

When a helicopter is on the ground a friction lock, and/or similar device, is applied to the collective to stop it being raised. If the friction lock is faulty, and the collective vibrates up, it will increase the pitch on the blades. The governor will then increase the power by a corresponding amount. If there is enough weight in the helicopter, this in itself would not be enough for it to become airborne, but sometimes the reduction in weight from the pilot getting out can mean there is just enough power applied to get the helicopter airborne.

A friction lock is also applied to the cyclic. If this fails the rotor disk will flop around. The yaw pedals also have the potential to creep or be bumped by a passenger. This can lead to the helicopter rotating on the ground and more than likely rolling over as a result. ■







Photos courtesy of Pacific Aircraft Services and Helipro

Runway Incursions **Decreasing**

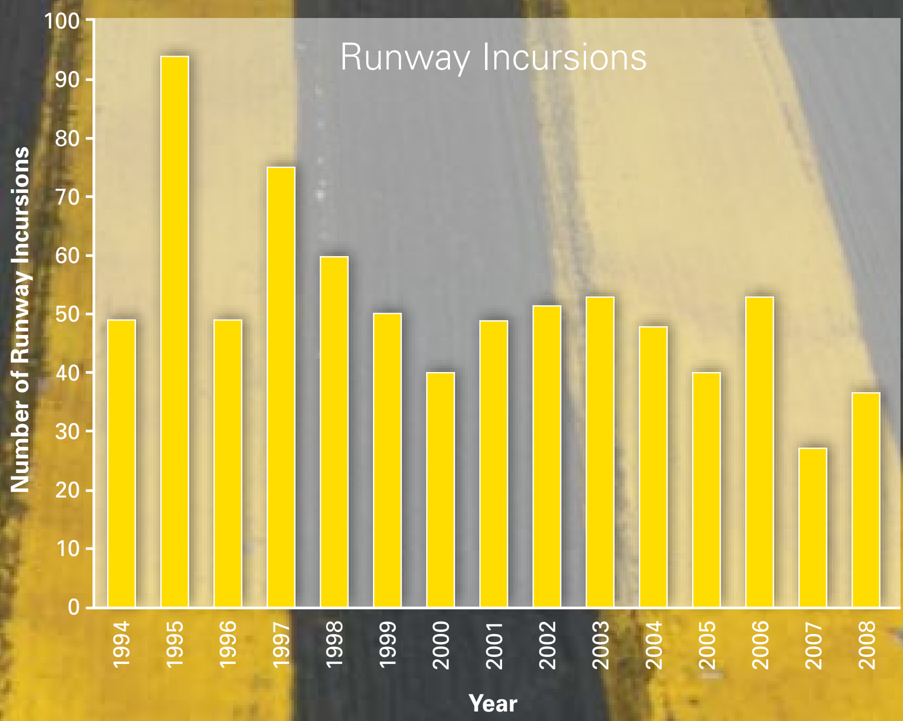
Runway incursions are a significant hazard to aviation. In countries where traffic density is much greater than in New Zealand, runway incursions have been on the increase for several years. New Zealand's runway incursions, however, are steadily decreasing.

In 2001, ICAO took action to address the problem of runway incursions, and in 2007 produced a Manual on the Prevention of Runway Incursions, which included the following definition. A runway incursion is: *"any occurrence at an aerodrome involving the incorrect presence of an aircraft, vehicle or person on the protected area of a surface designated for the landing and takeoff of aircraft."*

As a result of the ICAO initiative, the CAA reviewed relevant occurrence data from 1994 to 2008, and identified occurrences that would qualify under the new definition as runway incursions.

Two outcomes of this review are of particular interest. Firstly, if the definition had been applied from 1994 there would have been a lot more occurrences classified as runway incursions than originally thought, and secondly, the number is decreasing from a peak of around 90 in 1994 to less than 40 in 2008.

From November 2008, all occurrences meeting the new definition have been recorded as runway incursions regardless of the classification applied by the reporter. In the first 6 weeks of 2009, five occurrences have been classified as runway incursions. ■



The number of runway incursions in New Zealand, by year, had the new definition been applied from 1994 onwards.

Safety Targets Update

In 2005, the CAA set safety targets for each sector of the aviation industry to reach by 2010. The targets measure the social cost of aviation – not just numbers of accidents. They incorporate statistical values for fatalities ($3.37 million per injury), serious injuries ($352,300), and minor injuries ($15,000), as well as the value of the aircraft destroyed. The unit of exposure for the targets is one seat hour, except for those sectors that are not passenger carrying. In these sectors a surrogate of 500 kg of aircraft weight is used instead of seat hours.

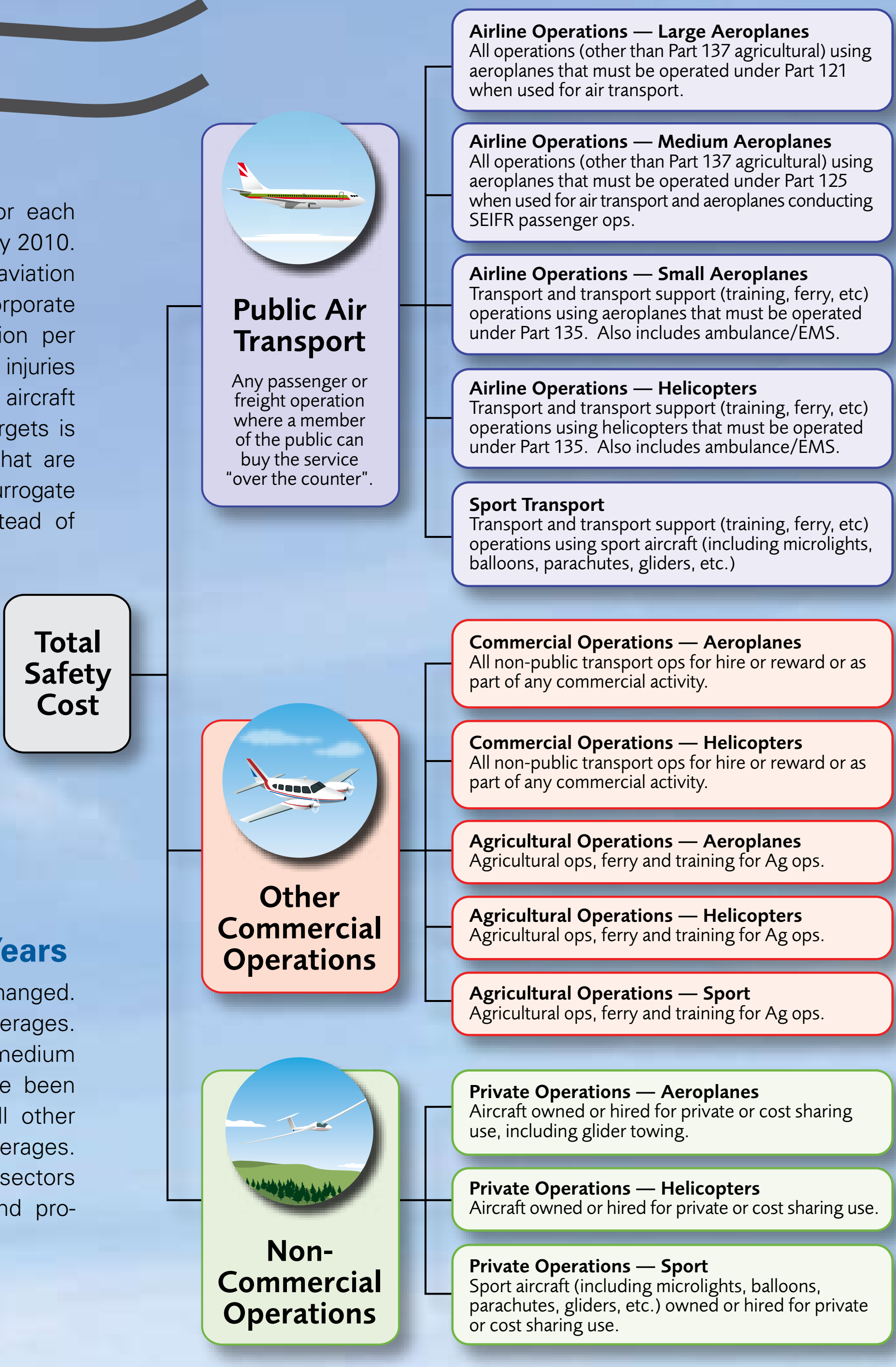
Industry Growth

General Aviation continues to grow. In 2008 a further 69 sport aircraft, 49 helicopters and 43 small aeroplanes were added to the New Zealand register. In 2008 there were 5.4 percent more aircraft movements at certificated aerodromes than in 2007 (where data is collected).

Averages Now Over Three Years

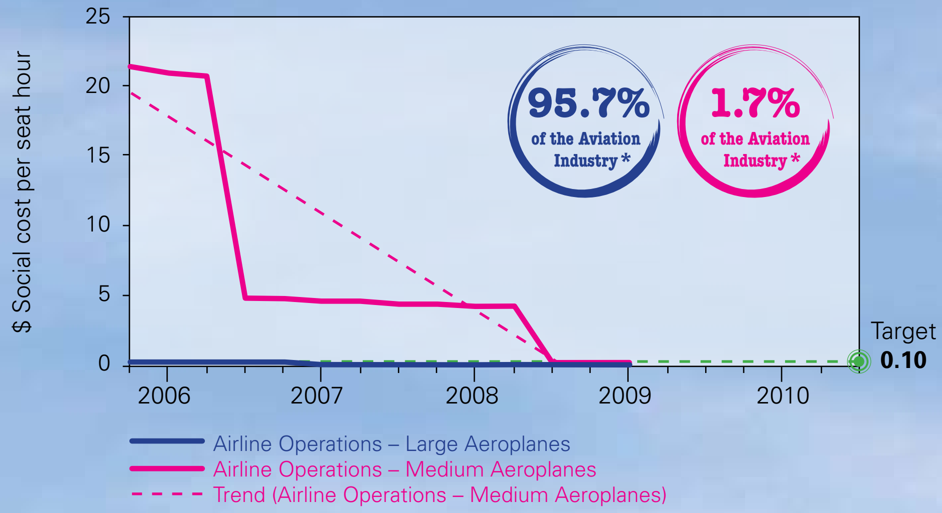
The periods for all results have been changed. All graphs are now shown as three-year averages. In the past, the graphs for large and medium aeroplanes used in airline operations have been shown over a ten-year average, while all other sectors were shown over 12-month averages. The change to three-year averages for all sectors improves comparison between groups and provides a clearer picture of safety progress.

Safety Target Structure



These figures show moving averages for each sector to the end of December 2008.

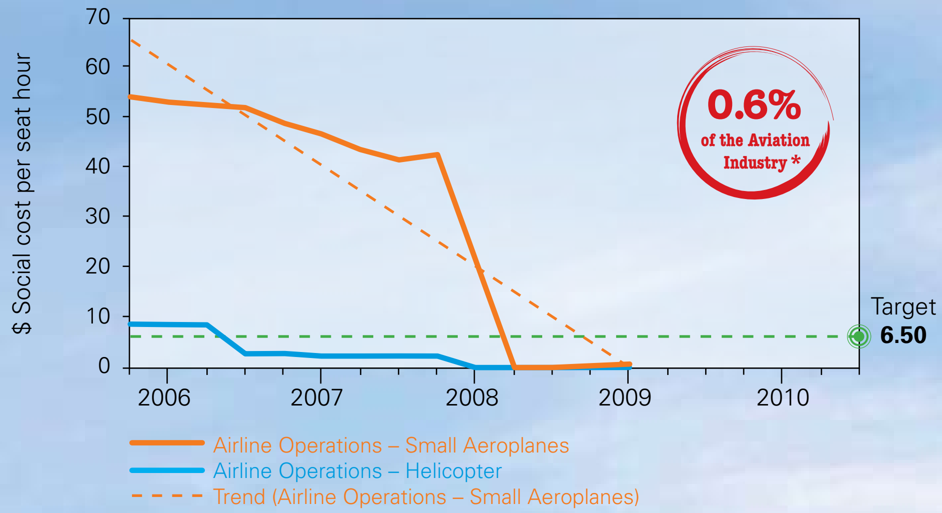
Social Cost
Airline Operations – Large and Medium Aeroplanes



Large aeroplanes have remained at or below the required target since 2005.

The medium aeroplane sector currently exceeds its target, but is trending down. It is possible for the target to be achieved in 2010. There were no injuries in this sector over the two and a half years to December 2008.

Social Cost
Airline Operations – Small Aeroplanes and Helicopters



Small aeroplanes used in airline operations have achieved a significant long-term downward trend from the high starting point caused by six fatal and two serious injuries, and one minor injury in the three years to September 2005. There have been no fatal or serious injuries in this sector in the three years to December 2008. This sector has been below its target since Mar 2008.

There have been no fatal or serious injuries among helicopters used in airline operations since 2003 and this sector currently meets its target.

Social Cost
Sport Transport

The sport transport sector has improved since early 2007 and is now just below its target. There were 11 serious and three minor injuries in this group in the three years to December 2008.

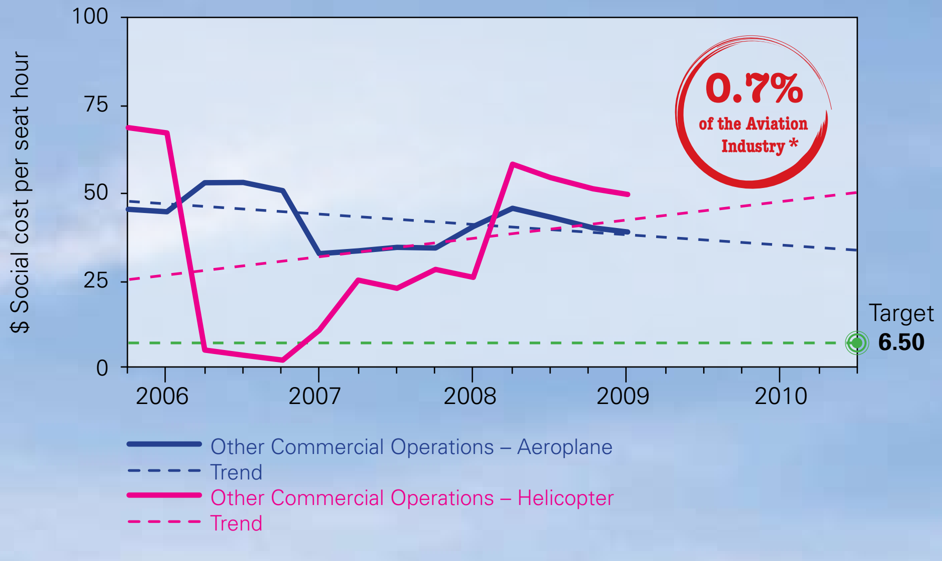
* Based on seat hours

Continued over »

The expressions "Non-Commercial Operations", "Other Commercial Operations", and "Public Air Transport" are used to explain in a simple way the groupings that are used in the analysis of data. These expressions do not reflect the legal definitions in the Civil Aviation Rules or the Civil Aviation Act 1990.

» Continued from previous page

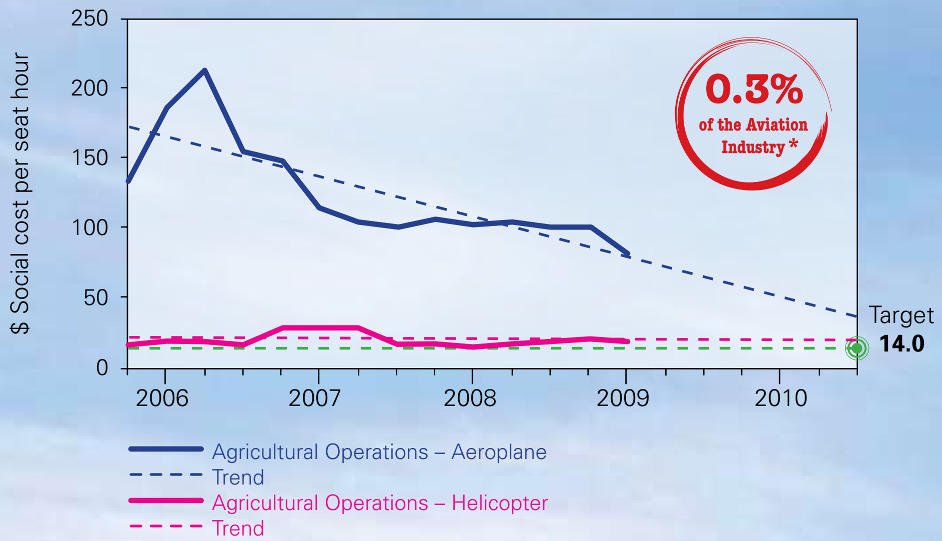
Social Cost
Other Commercial Operations – Aeroplanes and Helicopters



Aeroplanes used in commercial operations (other than airlines) are well above their target. In the three years to December 2008 there have been six fatal, three serious and five minor injuries in this sector.

Helicopters used in commercial operations (other than airlines) are also well above the target. There have been two fatal, one serious and 10 minor injuries in this sector in the three years to December 2008.

Social Cost
Agricultural Operations – Aeroplanes and Helicopters



Aeroplanes used in agricultural operations are well above their target. During the three years to December 2008 there have been three fatal injuries and one serious injury in this sector.

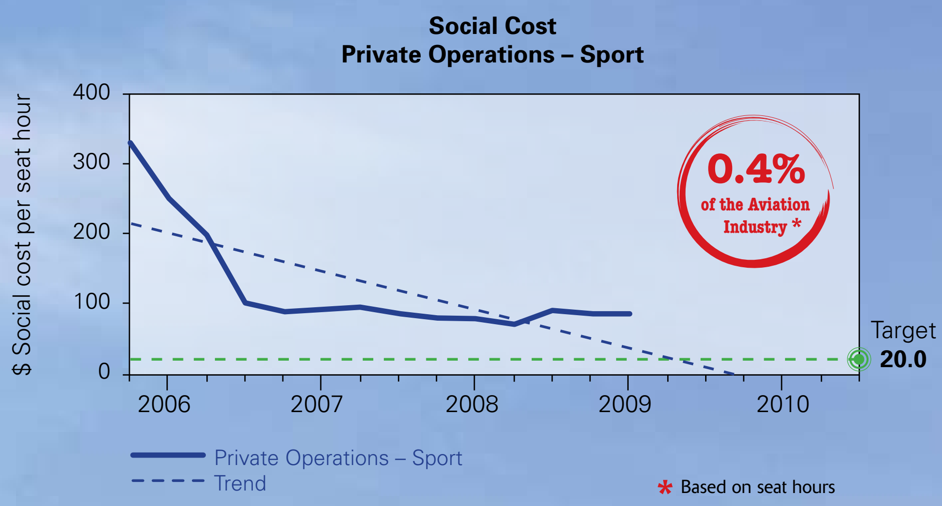
Helicopters used in agricultural operations are also above their target. There has been one fatal injury, one serious injury and two minor injuries in this sector in the three years to December 2008.

Social Cost
Private Operations – Aeroplanes and Helicopters

Aeroplanes used in private operations have been trending down since late 2005. There were two fatal, three serious and three minor injuries in this sector during the three years to December 2008.

Helicopters used in private operations have been trending down since early 2006. There have been three fatal and nine minor injuries in the three years to December 2008.

* Based on seat hours



Sport aircraft used in private operations have been trending down since late 2005. There were 13 fatal, 25 serious and 24 minor injuries in the three years to December 2008. ■

Becoming a Maintenance Controller

There is a huge amount to understand about the maintenance requirements for aircraft. All Part 119, 137, and 141 organisations are required to have a designated Maintenance Controller. If you are responsible for the maintenance of your organisation's aircraft, or even if you own your own aircraft, the CAA's Maintenance Controller Course will give you the building blocks you need to understand the planning and direction of maintenance.

The course is in two parts. Part One is a pre-workshop, self-paced, learning module. The aim is to introduce you to the Rules that provide the foundation for aviation safety in New Zealand. You will need to use the CAA web site for the pre-workshop module. Part Two is a two-day workshop. This is designed to be hands-on and practical.

The New Zealand Qualifications Authority (NZQA), in conjunction with the Aviation, Tourism and Travel Training Organisation (ATTTO), have written 'Units of Learning' for the course. All participants who pass the Maintenance Controller course, then undergo an on-the-job assessment, and an oral exam, will be issued with a National Certificate in Aeronautical Engineering (Maintenance Controller).

Proposed Course Dates for 2009

22 to 23 April – Blenheim
20 to 21 May – Hokitika
24 to 25 June – Queenstown
19 to 20 August – Taupo
23 to 24 September – Auckland

A minimum number of attendees are required for the courses to go ahead. Some courses may be combined, if necessary, to meet the minimum number.

To register for a course, fill in the registration form on the CAA web site, www.caa.govt.nz, under "Seminars and Courses/Maintenance Controller Courses" and send, with the $100 registration fee, to:

John Bushell
GA Airworthiness Coordinator,
P O Box 31-441,
Lower Hutt 5040
Email: bushellj@caa.govt.nz ■

Presenters of the Maintenance Controller Course (from left): John Bushell, John Keyzer, and Bob Jelley.

New **Aircraft Logbooks**

New Aircraft Logbooks are now available. The four logbooks – Engine, Aircraft, Propeller, and Airworthiness Directives – have had a makeover, in consultation with a number of users, to take into account recent rule revisions and make them more user-friendly.

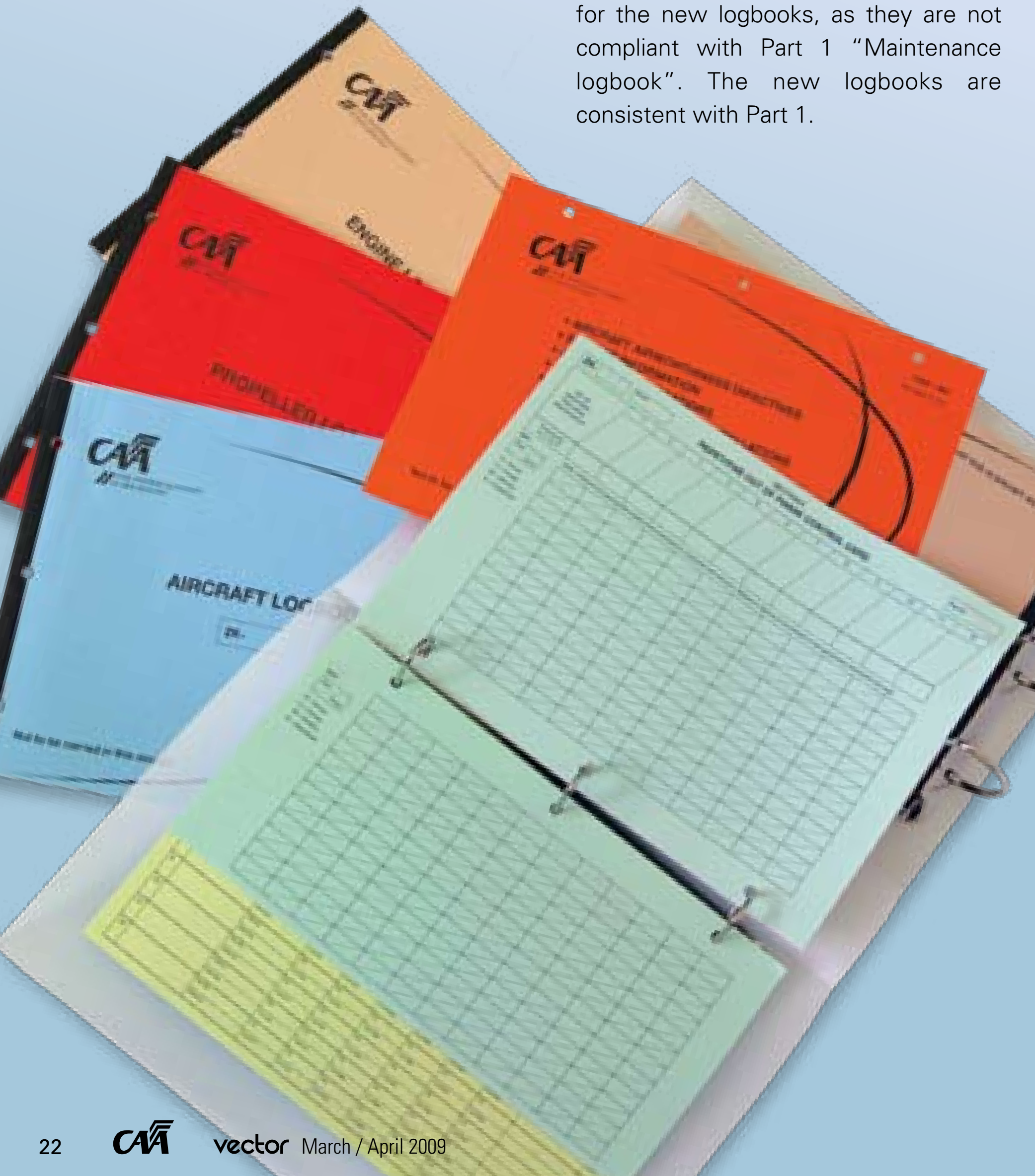
The Engine and Propeller Logbooks essentially remain the same, except for updating of the Instructions for Use and minor format changes. The Aircraft Logbook now contains only service and maintenance information. The Lifed Components Record, Out of Phase Record, and Weight and Balance Record, have now been shifted to the Airworthiness Directive (AD) Logbook.

The format of the AD Logbook has been extensively revised and is now in a loose leaf form to enable operators to have more or less pages to suit their requirements.

Operators purchasing a new Aircraft Logbook for the first time will also need to purchase the new Airworthiness Directive Logbook because of the sections that have been moved to the Airworthiness Directive Logbook. All the Aircraft logbooks can be purchased individually.

A new binder, designed to hold all four logbooks (or six for a twin) will also be available for purchase.

Operators who are currently using the soft-covered logbooks may continue to use them till replacements are required. Operators with the old hard-covered logbooks are required to change them for the new logbooks, as they are not compliant with Part 1 "Maintenance logbook". The new logbooks are consistent with Part 1.



It is also planned to have Section 1 of the Airworthiness Directives Logbook available on the CAA web site as a PDF file that operators can fill in, save and print.

The new logbooks can be purchased from The Colour Guy, Email: orders@colourguy.co.nz, Tel: 0800 GET RULES (0800 438 785).

For more information on the new logbooks, contact John Bushell, Airworthiness Coordinator, email: bushellj@caa.govt.nz. ■

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Medicals Made Easier

The introduction of revised General Directions will make it simpler to maintain your medical certificate, and as a result the ongoing costs should fall. In particular, they have removed the need for a periodic audiogram for most Class 2 certificate holders, and have extended the validity period of a number of routine tests.

With effect from March 2009, a Class 2 medical certificate holder who flies VFR-only will no longer be required to have regular four-yearly audiograms. For these pilots, the passing of a "conversational voice test", administered in a Medical Examiner's rooms, will be adequate for certification. If a private pilot wants to fly IFR, then they will still need to have audiograms at the intervals applied to Class 1 holders. As a result of this change, most Class 2 medical certificate holders will not need to have audiograms and will have their medical certificate endorsed as "Not valid for IFR flight". This change will benefit Class 2 certificate holders who do not fly IFR.

Changes have also been made to the Class 1 and 3 audiometry requirements. Instead of two-yearly routine audiometry, Class 1 and 3 applicants who are 48 years of age or older will now be required to undergo routine audiometry on a four-yearly basis. This change will benefit holders of Class 1 and 3 medical certificates as well as Class 2 certificate holders who fly IFR.

The validity periods of several routine tests are also being increased from 90 days to twelve months. The tests that this applies to are the routine: ECG; cardiovascular risk assessment; blood lipids (eg, cholesterol); chest x-ray (although not routinely required for most applicants); spirometry (breathing test); blood sugar testing (for diabetes and similar disorders); audiometry (when it is required); special vision examinations; and colour vision screening test (usually the book with the coloured-dot numbers). This change will benefit many applicants whose medical assessment takes longer than 90 days, because most of the required routine tests will not have to be repeated.

Another change is a reduction in the frequency of cardiovascular risk assessment for those who are 35 years of age or older, but not yet 70. Until now, this assessment has been undertaken either annually or with each new application. The changes shift this requirement from annually to two-yearly. This change will have most benefit for Class 1 and 3 certificate holders, as it should result in a reduction in the frequency of some blood tests, and less administration work for the Medical Examiner.

It is important to note that these changes apply only to routine testing. In cases where medical problems have already been identified, or are suspected, it is likely, and entirely reasonable, for some tests to be undertaken more often.

These changes come into force with the revision of two of the medical General Directions (GDs): *Timing of Routine Examinations*; and *Examination Procedures*. These revised GDs have been signed by the Director of Civil Aviation, have been gazetted, and will come into force 1 March 2009.

For further details, these new GDs are on the CAA web site, www.caa.govt.nz, see "Medical". ■

Summary of Changes to Medical Requirements

Class 1	Class 2	Class 3
Four-yearly routine audiograms for pilots 48 years of age and older.	Routine audiogram only required for Class 2 IFR operations. Routine "conversational voice test" used to test the hearing of other Class 2 certificate holders.	Four-yearly routine audiograms for pilots 48 years of age and older.
Routine cardiovascular risk assessment now required 2-yearly for 35 to 70 year olds.		
Routine ECGs, cardiovascular risk assessments, blood lipid tests, chest x-rays, spirometry, blood sugar tests, audiometry (Class 1 and 3), special vision examinations, and colour vision screening tests are now valid for twelve months (from 90 days).		

Te Anau Closed

Effective 9 April 2009, Te Anau Aerodrome will close permanently, and the name of Manapouri Aerodrome will change to Te Anau/Manapouri Aerodrome (retaining the location indicator NZMO).

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).

Inspection Authorisation (IA) Initial Course 2009

A Part 66 IA Certificate is an additional qualification, over and above holding a Part 66 AME Licence, to perform and certify the following two maintenance functions:

1. An Annual Review of Airworthiness (ARA).
2. Conformity of Major Modifications and Repairs.

Courses are run when there are sufficient numbers. One course is planned for 2009, tentatively for October.

If you are interested in attending a course, please contact:

Mark Price
AME Examiner
Tel: 0-4-560 9619
Email: pricem@caa.govt.nz

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

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".

Planning an Aviation Event?

If you are planning an event, large or small, such as an airshow, air race, rally, or major competition, the details should be published in an *AIP Supplement* to warn pilots of the activity.

The published cut-off dates for the AIP are listed below, but you must advise the CAA ***at least one week*** before those dates, to allow for inquiries and processing. Note that, even if you have applied to the CAA for an aviation event authorisation, this does not automatically generate an *AIP Supplement* or airspace request.

Email the CAA, aero@caa.govt.nz. Further information on aviation events is in AC91–1.

Effective Date	***Cut-off Date With Graphic***	***Cut-off Date Without Graphic***
2 Jul 09	20 Apr 09	27 Apr 09
30 Jul 09	18 May 09	25 May 09
27 Aug 09	15 Jun 09	22 Jun 09

Accident Briefs

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

ZK-EWD Cessna 172P

Date and Time:	25-Oct-07 at 10:39
Location:	Omaka Ad
POB:	2
Injuries (Minor):	1
Damage:	Substantial
Nature of flight:	Training Solo
Pilot Licence:	PPL (Aeroplane)
Age:	22 yrs
Flying Hours (Total):	90
Flying Hours (on Type):	30
Last 90 Days:	85

The pilot inadvertently landed with a tailwind and, on realising he could not stop, attempted a late go-around. The aircraft snagged a perimeter fence wire, and the pilot pulled up abruptly to avoid a line of trees. This resulted in a stall. The aircraft came to rest on a river stop-bank facing the way it had just come. The pilot and passenger were not hurt. The operator reported that the pilot had become disorientated; although he was quoting the runway in use in his radio calls, he flew a circuit for the reciprocal runway and tried to land with a 15-knot tailwind.

CAA Occurrence Ref 07/3819

ZK-HDB Robinson R22 Beta

Date and Time:	17-Nov-07 at 13:00
Location:	Haupiri
POB:	0
Injuries:	0
Damage:	Destroyed
Nature of flight:	Agricultural
Pilot Licence:	CPL (Helicopter)
Age:	38 yrs

Collective lock not applied, and failure of factory friction nut, allowed collective lever to rise, and the machine flew unattended before crashing.

CAA Occurrence Ref 07/4122

ZK-NRS Foxcon Aviation Terrier 200

Date and Time:	17-Jan-08 at 18:31
Location:	Landcorp Cape
POB:	2
Injuries:	0
Damage:	Substantial
Nature of flight:	Private Other
Pilot Licence:	CPL (Aeroplane)
Age:	59 yrs

A faulty distributor rotor button caused the engine to run rough. The pilot carried out a forced landing, during which the nose gear collapsed.

CAA Occurrence Ref 08/160

ZK-HKM Robinson R22 Beta

Date and Time:	29-Jan-08 at 8:37
Location:	Napier
POB:	0
Injuries:	0
Damage:	Destroyed
Nature of flight:	Private Other
Pilot Licence:	CPL (Helicopter)
Age:	47 yrs
Flying Hours (Total):	1348
Flying Hours (on Type):	1190
Last 90 Days:	29

The helicopter was left unattended without friction or collective lock applied. The pilot heard the rpm increase but was too late to prevent liftoff and rollover. The machine was destroyed.

CAA Occurrence Ref 08/255

ZK-EZI Piper PA-38-112

Date and Time:	5-Mar-08 at 16:00
Location:	Kaikoura
POB:	1
Injuries:	0
Damage:	Substantial
Nature of flight:	Training Solo
Pilot Licence:	PPL (Aeroplane)
Age:	18 yrs
Flying Hours (Total):	150
Flying Hours (on Type):	32
Last 90 Days:	73

The aircraft veered off the side of Runway 23 at Kaikoura during the landing roll. The most likely cause was the student not fully assessing the current wind conditions and not compensating for the crosswind and windshear during the approach and landing. Damage occurred to the left wing leading edge, and the propeller was bent.

CAA Occurrence Ref 08/901

ZK-FYF Micro Aviation B22 Bantam

Date and Time:	18-May-08 at 23:40
Location:	Parakai Ad
POB:	2
Injuries:	0
Damage:	Minor
Nature of flight:	Training Dual
Pilot Licence:	Nil
Age:	66 yrs
Flying Hours (Total):	2209
Flying Hours (on Type):	800
Last 90 Days:	19

The aircraft made a heavy landing and damaged the undercarriage.

CAA Occurrence Ref 08/2184

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.

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

Alpha R2160

Oil Pressure Gauge &Transducer

ATA Chapter:	7930
TTIS hours:	443.7

The pilot reported to the tower a low oil pressure reading and made a PAN call. The flight landed safely. An engine ground run did not identify any abnormal oil pressure readings. The aircraft has had a history of high and low oil pressure readings. The oil line from the transducer was flushed and the oil pressure gauge and transducer were replaced. The engine was ground run and the aircraft was returned to service.

CAA Occurrence Ref 07/1525

Beech 58

Roll Servo Wiring

Part Manufacturer:	STEC
Part Number:	0106
ATA Chapter:	2200

During the pre-flight check on the aircraft the pilot found the roll servo sense reversed. Investigation found the wiring at the servo plug to be incorrect. A factory repaired roll servo had just been installed and a duplicate inspection carried out prior to a release to service being issued. The wiring was changed to provide the correct sense. The maintenance organisation has had staff training and reviewed their internal procedures to try and prevent any reoccurrence.

CAA Occurrence Ref 07/3854

Cessna 152

Barrel/ Piston Pin Plug

Part Model:	O-235-L2C
Part Manufacturer:	Lycoming
ATA Chapter:	8530
TTIS cycles:	1900

During scheduled maintenance, aluminium was found in the engine oil suction and pressure filters. All four cylinders were removed and inspected. The No 1 cylinder had a significant lip -0.004" at the bottom of the piston travel and was causing the piston pin plug to start shaving on the sharp edge. The No 3 cylinder showed signs of starting to wear in similar fashion but had not progressed to the same extent as the No 1 cylinder. The Nos 2 and 4 cylinders exhibited normal wear for the hours on the cylinders. The cylinders have been sent in for appropriate repair.

CAA Occurrence Ref 08/1683

Cessna 172M

Cylinder Base Studs

Part Model:	O-320-D2G
Part Manufacturer:	Lycoming
ATA Chapter:	8530
TSI hours:	43.3
TSO hours:	2691.7
TTIS hours:	8138.1

An oil leak was reported from the engine in the vicinity of the number two cylinder. Engineering inspection found that the forward top through bolt stud and nut were missing. Also, the two cylinder base studs behind it, and the stud seven nuts were missing. No other studs or nuts missing on this or any other cylinder. The cause is believed to be related to the high total-time-in-service of the engine. An engine overhaul is to be carried out.

CAA Occurrence Ref 08/1213

Cessna 172N

Carburettor

Part Model:	MA3A
Part Manufacturer:	Marvel Schebler
ATA Chapter:	7320
TTIS hours:	1326

At the top of descent, the pilot tried to reduce the engine rpm, but there was no apparent change in the engine speed. The aircraft was positioned for a glide approach and the mixture was cut to stop the engine. Investigation found that the pump discharge tube (accelerator tube) on the carburettor had come loose and jammed the throttle butterfly. The pump discharge tube appears to vibrate loose after a period of time, and eventually falls out. The problem is known to exist with Marvel Schebler carburettors Part Nos. MA3A, MA3PA, MA3SPA, and MA4SPA. Airworthiness instructions are being developed to prevent the fault from recurring.

CAA Occurrence Ref 07/1707

Cessna A185F

Crankshaft Gear

Part Model:	IO-520-D
Part Manufacturer:	Teledyne Continental Motors
ATA Chapter:	7200
TTIS hours:	1513.7

The pilot reported a rough-running engine. An engine strip discovered a non-metallic foreign material the size of a small stone in the sump. The source of the material could not be established. The material had marks consistent with those created by contact with gear teeth. Two teeth were found to be missing from the crankshaft gear, and the starter shaft and camshaft gear were also found damaged.

CAA Occurrence Ref 07/938

Cessna U206F
Switch

Part Model:	U206F
Part Manufacturer:	Cessna
Part Number:	S1846-1-3
ATA Chapter:	3340

During the takeoff roll, a burning smell and smoke was detected coming from the landing light switch on the panel. The takeoff was safely aborted. The switches were turned off, the cabin was ventilated, and the smoke stopped. On investigation it was found that the landing light switch had overheated and melted, and had also caused some minor heat damage to the associated wiring. The failure was put down to the age and frequent usage of the switch. The switch was replaced and as a precaution the wiring for the landing lights was also replaced. CAA note that there have been similar reported failures of landing light switches in Cessna aircraft.

CAA Occurrence Ref 08/1657

Cessna U206F
Starter Adaptor

Part Model:	IO-520-F
Part Manufacturer:	Continental
Part Number:	643259
ATA Chapter:	8000
TTIS hours:	761.3

The starter was slipping and would not crank the engine. Investigation found the crankshaft gear bolt lockwire broken and noted that the starter adaptor spring had moved down to contact the bolts. This was attributed to a broken retaining tang on the spring. The broken tang was found in the engine sump. The Maintenance Organisation recommends that at the first sign of the starter slipping, the adaptor be removed for inspection. The starter adaptor was repaired with an oversize spring, and the bolts were relocked.

CAA Occurrence Ref 08/774

Fletcher FU24-950M
Fin-L/E

Part Number:	242309-2L
ATA Chapter:	5530
TSI hours:	51.04
TSO hours:	451.01
TTIS hours:	451.01

While performing the fin leading edge inspection in accordance with the airworthiness directive DCA/FU24/176C, two lines were observed in the paint either side of the fin's leading edge. The fin was removed and the area paint stripped to allow closer inspection of the skin. No cracks were found. The lines were thought to be caused by the fin's lower cover being fitted while the paint was still wet, which left an indent mark which looked like a crack

CAA Occurrence Ref 07/3915

Micro Aviation B22 Bantam
Fuel Pump

The aircraft experienced an engine failure shortly after takeoff (at around 50 feet) on Grass Runway 16. The aircraft landed safely back on grass Runway 16. No assistance was required. The pilot advised of a fuel pump failure.

CAA Occurrence Ref 07/3255

NZ Aerospace FU24-954
Engine Attachment Bolt

Part Model:	FU24-950 Walter
Part Manufacturer:	PAC
Part Number:	NAS 6606-56
ATA Chapter:	7120
TSI hours:	14.4
TTIS hours:	1648.54

During the takeoff run the nose section of the aircraft suddenly pivoted to the right by about 50 mm and the engine controls jammed, preventing the pilot from shutting down the engine or feathering the prop. The pilot jettisoned the load and intentionally ground looped the aircraft. The investigation found that the lefthand top engine mount bolt had broken as a result of not being adequately torqued. The bolt failure was attributed to fatigue caused by movement in response to applied engine loads. The fatigue life for the engine mount bolts has been reduced from 1600 hours to 900 hours by the STC holder, and a recheck of the bolt torque is now required every 300 hours.

CAA Occurrence Ref 07/1292

NZ Aerospace FU24-954
Engine Mount

Part Manufacturer:	Turbine Conversions Ltd
Part Number:	TCL-02-010-2
ATA Chapter:	7100

During scheduled maintenance, a 5-mm crack was discovered propagating out from the upper left bolt hole in the engine mount.

CAA Occurrence Ref 07/2577

Piper PA-23-250
Wheel Hub

Part Model:	40-131
Part Manufacturer:	Cleveland
Part Number:	162-00700
ATA Chapter:	3240
TSO cycles:	48

The main landing gear outboard wheel hub was found cracked during a scheduled inspection. The hub was replaced.

CAA Occurrence Ref 07/1955

Piper PA-38-112
Oil Temperature Gauge

Part Model:	PA-38-112
Part Manufacturer:	Piper
ATA Chapter:	7930

During a cross-country flight, the pilot noticed a high engine oil temperature indication. He diverted to the nearest aerodrome. When contacted, the maintenance provider suggested that the pilot should cycle the battery master switch. This was carried out and a normal temperature indication was obtained. The pilot then flew the aircraft to home-base, where the aircraft was checked and the oil temperature was found to be indicating correctly. The maintenance provider notes that the defect appears to be an ongoing intermittent problem with the electrical gauges in the PA-38.

CAA Occurrence Ref 08/775

AV KIWI

SAFETY SEMINARS

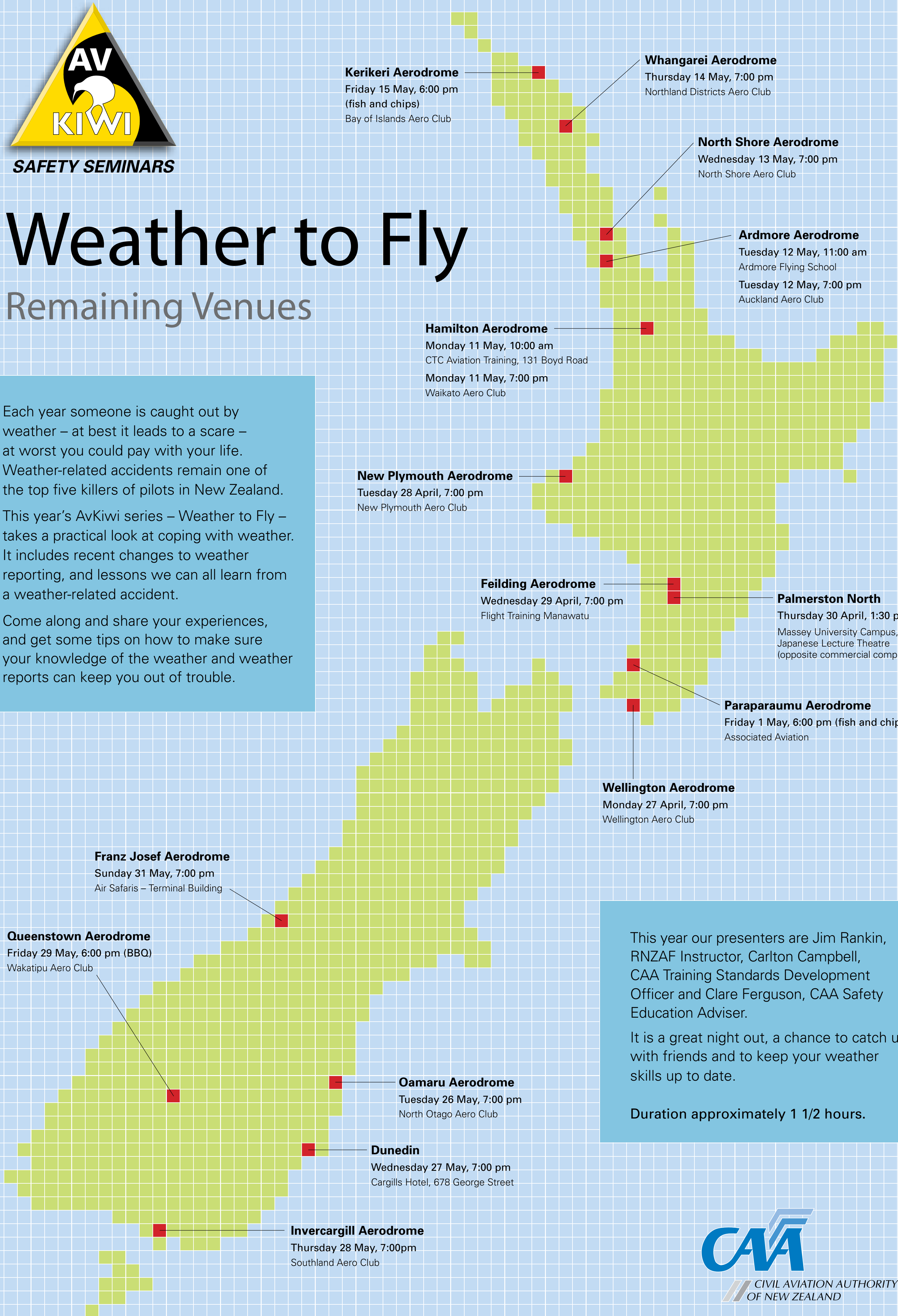
Weather to Fly

Remaining Venues

Each year someone is caught out by weather – at best it leads to a scare – at worst you could pay with your life. Weather-related accidents remain one of the top five killers of pilots in New Zealand.

This year's AvKiwi series – Weather to Fly – takes a practical look at coping with weather. It includes recent changes to weather reporting, and lessons we can all learn from a weather-related accident.

Come along and share your experiences, and get some tips on how to make sure your knowledge of the weather and weather reports can keep you out of trouble.



This year our presenters are Jim Rankin, RNZAF Instructor, Carlton Campbell, CAA Training Standards Development Officer and Clare Ferguson, CAA Safety Education Adviser.

It is a great night out, a chance to catch up with friends and to keep your weather skills up to date.

Duration approximately 1 1/2 hours.

CAA

CIVIL AVIATION AUTHORITY OF NEW ZEALAND