

vector

Helicopter Safety – Getting There

Flight Planning is No Time to Wing It

Taking to the Skies this Summer

Explaining Hood Happenings



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Helicopter Safety – Getting There

Helicopter flying has experienced radical improvements in safety since the industry took off in the 1970s. *Vector* looks at the challenges remaining to getting the accident stats as low as possible.



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Flight Planning is No Time to Wing It

Before any flight, don't leave the planning to chance. Set yourself up for success by gathering and interpreting information, and planning for any contingencies.



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Taking to the Skies this Summer

The return of long days of endless sunshine also sees the return of many pilots to the skies following a winter hibernation. We've got some tips to ensure you're ready to take off into summer.



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Explaining Hood Happenings

There'll be extra activity in Wairarapa this summer, as WWI aircraft pilots practise their manoeuvres for a bumper crop of upcoming airshows. What contemporary pilots can expect if they visit Hood Aerodrome at Masterton.

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Cover: Per capita, New Zealand is the most 'helicoptered' country in the world. Read about helicopter safety on page 4. Photo: Ned Dawson (*Heliops* magazine).

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Des Barker Seminars in January

Major General (retired) Des Barker, the world-renowned author of the airshow organisers' bible, *Zero Error Margin*, will be in New Zealand in January 2015 to present five seminars.

Des says he is looking forward to this "once-in-a-lifetime opportunity to visit New Zealand which is home to many internationally renowned airshows."

The Weakest Link

"New Zealand's aviation and display safety statistics are admirable," says Des, "but as all good aviators know, safety is a continuous 'in your face effort', particularly in the high pilot workload of low level display flying.

"The fallibility of humans makes us the weakest link in the safety chain. We are not designed with 360 degree peripheral vision, and statistics show that we don't necessarily learn from our mistakes. Continuous consideration of the worst case scenario must be the underlying approach to managing safety, while simultaneously managing any associated risk. And as pilots, that is what we are doing all the time to remain safe.

"Following on from what I would call 'black 2010' which was the worst year in airshow safety history worldwide, the European Airshow Council, the Airshow Society of South Africa, and the USA's International Council of Air Shows, undertook an aggressive campaign towards continuous safety by issuing reminders to airshow communities about the threats and challenges facing them.

"Getting together with the aviation community in New Zealand provides opportunities to benchmark and share safety challenge notes. This is a chance to discuss the threats and challenges, and to identify the traps that exist for the aviation community. It's the perfect occasion to ask: 'What is the best way to plan for the vast matrix of things that could go wrong at an airshow?'"

Unique Opportunity

Jeanette Lusty, Team Leader Flight Operations Adventure Aviation, says, "The CAA is delighted that Des has accepted this invitation. Many people from the aviation community are supporting his visit in one form or the other, and we thank them all for making this event possible."

She encourages the aviation community to utilise this opportunity.

"Des's visit provides pilots, airshow organisers, and interested parties with a valuable opportunity to benefit from his vast experience and knowledge base. Equally, Des is interested in hearing about how the New Zealand airshow and aviation community face the various challenges that regularly come their way," says Jeanette.

Topics covered include:

- » Describing and understanding how highly trained professional individuals with carefully planned sequences can still make mistakes.
- » Assisting airshow organisers to manage the many anomalies while still providing a good visual and safe airshow.
- » The dynamics of energy loss in tumble manoeuvres.
- » Spectator enclosures and how safe they are.
- » Crowd control in an emergency.
- » The discipline line of showing off yourself rather than the display aircraft.

Registration is essential, email: Jeanette.Lusty@caa.govt.nz ■



Masterton

Saturday 17 January
5:30 pm
*Sport and Vintage
Aviation Society
briefing room
Hood Aerodrome*

Manawatu

Wednesday 21 January
Afternoon – time to be
confirmed when you
register
RNZAF Base Ohakea

Auckland

Friday 23 January
6 pm
*New Zealand Warbirds
club rooms
Ardmore Aerodrome*

Wellington

Tuesday 27 January
9:30 am
*Civil Aviation Authority,
Level 15,
Asteron Centre,
55 Featherston Street*

Wanaka

Friday 30 January
6 pm
*Edgewater Resort
54 Sargood Drive*

Helicopter Safety – Getting There

Twenty-one fare paying passengers died in helicopter accidents in the 10 years to 2001. In the decade following, not one. *Vector* talks to sector leaders about that phenomenal improvement, and the remaining obstacles to getting the stats as low as possible.

First, the statistics. From 1970 to 2013, there were 188 deaths in helicopter accidents and 346 machines destroyed or written off, costing the sector at least \$1 billion.*

The early days were undoubtedly the more dangerous with only basic training, few standards, and machines being pushed beyond their capability.

Safety advocate and author, Walter Wagtendonk, says when the lucrative venison market was established, newly-qualified pilots entered a dangerous and badly-regulated environment.

“Bravado didn’t help,” he says.

But those early years were not all machismo and recklessness. Many pilots who survived them helped to usher in a much-improved era in helicopter safety. They matured and so did the sector.

In 1982, there were 14 deaths in the helicopter sector, in 2013, three. That fall is backdropped by a doubling in the number of helicopters on the register from 420 in 2000 to more than 800 today.

Helicopter safety consultant, John Fogden, credits much of that to certification.

“The introduction of Part 119 and risk management principles have been the greatest contributors to a safer industry.

“Certification in 2000 put the onus on the industry to set its own standards. Allowing participants to take ownership of their own destiny made them realise that safety and the continuity of their business relied on them.”

Walter Wagtendonk says the benefits slowly became evident.

“Certification introduced the principles of ‘consultation on any rules and no unnecessary rules’ which markedly improved the relationship between the CAA and industry, which in turn had a decided effect on safety.”

“It’s much more effective to establish your own rules than to be asked to comply with someone else’s,” agrees Mike Toogood, Chief Executive Officer of air ambulance company, Skyline Aviation.

“The EMS sector developed its own manuals and standards, and continues to, itself, review those standards and improve practice.” He says it’s no random association that the sector, while naturally high risk (winching, night operations, SAR) has few accidents.

Although no-one says the present accident rate is acceptable – three people died from August to October 2014 – the wider helicopter sector hums with initiatives and it’s paying off.

Chair of the New Zealand Helicopter Association, Lloyd Matheson, says the historically accident-prone industry has moved to being one with a good safety record.

He says the association’s ‘jewel in the crown’, the AIRCARE™ Accreditation Programme is a great example of industry setting its own standards.

“Aircare is all about making General Aviation safer, environmentally cleaner, and more sustainable.”

It’s no secret that a number of operators objected to the way the programme was implemented, but Lloyd hopes they will eventually see it as a wholly positive step.

Another industry-led initiative is the adoption of frost protection Standard Operating Procedures (SOPs). With no certification underpinning those operations, a single pilot drew up his own and distributed them to whoever wanted them.

“Instead of keeping the SOPs to himself for commercial advantage,” says John Fogden, “he allowed everyone access to them. A great instance of the industry taking ownership of safety and of putting the safety – and reputation – of the entire sector above individual money-making.”

*(New Zealand Helicopter Association Safety Bulletin 2).



'Pants Down'

Exchanging information about accidents is a powerful way of preventing them, and one of the most effective examples is what John Fogden describes as the 'pants down' forum. He says you can hear a pin drop during sessions recently introduced to Aviation New Zealand conferences, in which people share their experiences of mistakes and almost-accidents.

Similarly, a couple of times a year, the country's dozen or so EMS chief pilots get together in a session closed to CEOs and managers, to candidly discuss events that have occurred in their sector and what steps it can take to ensure they are not repeated.

Safety analyst with the CAA, Joe Dewar, says safety systems can be improved if errors are known about and the lessons shared. Joe says that is what makes reporting so important.

"Helicopter accidents and fatalities are way out of proportion to the number of helicopters in New Zealand." On the basis that there are many small occurrences before one big accident, Joe encourages pilots and operators to report the small incidents.

"That information is invaluable, and if we use it in safety reports we totally 'de-identify' all the data so no event or person can be recognised," he says.

Joe has been working with the New Zealand Helicopter Association on developing data-based safety bulletins that have been circulated to helicopter industry members since July.

"The goal is not just to improve safety through education, but also to give a greater sense of 'one industry' because an accident affects not just the operator concerned but the whole sector," says Joe.

Helicopter Association Executive Officer, John Sinclair, says while it is too early to say if the bulletins have had any impact, he is heartened, as he tours the country, seeing them printed out and scattered around 'smoko' tables.



A unique feature of the Warbirds over Wanaka airshow is the number of helicopters the organisers manage to get together at one time. This flypast was during the 2014 event.

Photo courtesy of Gavin Conroy.

The Future

John Sinclair says there is no room for complacency.

"The accident rate has plateaued at about 20 a year for the last decade. Seventy-eight per cent of accidents are caused by pilot error, due mainly to unrealistic expectation of power available, mishandling, CFIT, and wire strike."

Despite that, John Fogden says one of the dangers now is complacency. "We have a new generation of helicopter pilots who have never been to a colleague's funeral and they are saying 'what's the fuss about, what needs fixing?'"

The other challenge is disunity.

"Helicopter pilots, by nature, are quite individualistic," says John Sinclair. "Although the big companies with 10-plus machines are right into a safety culture, almost half the companies in New Zealand have two or fewer aircraft.

"They can be quite hard to reach. Many don't see themselves as part of a 'community'. Typically they don't turn out to safety seminars and don't see anything they do having an effect on the rest, and vice versa. But of course it does. One accident hits the reputation – and business – of the whole sector."

Lloyd Matheson says the Helicopter Association's safety bulletins are also on its web site, so operators who are not part of the association can still access them. "We want to educate all operators about safe practice, not just our members."

CAA's manager of helicopter and agricultural operations, Steve Kern, says that operators, including the smaller ones, don't have to "reinvent the wheel" to improve safety.

"There's a huge amount of material on the Internet and some of the most valuable is on the International Helicopter Safety Team web site, www.ihst.org. For instance, the importance of effective training and competency is highlighted in the *Agricultural Aviation Sector Risk Profile* commissioned by the CAA and also features in Part 135 occurrences. The IHST web site has plenty of information on that.

"So look at that," he advises operators. "Look at what's around, talk to other operators, don't just do it all yourself or feel like you have to do it all yourself."

Aviation insurer Arden Jennings says he can help reach what he calls the "men of the bush" with a very practical reason they should take note of safety messages.

"When an operator attends a safety seminar, and I go to an awful lot of them as well, I'll put a tick on their file. If they can show me they have safety processes in place, that's another tick. One of the greatest fixed costs for operators is insurance and if they can prove they have a safety culture, that is obviously going to put them in a favourable light with the insurer."

Like many in the sector, Arden is enthusiastic about the introduction of Safety Management Systems (SMS). "I think it has to lead to fewer claims and lower premiums."

He says the soon-to-be mandatory requirement for organisations to establish a proactive, ongoing, risk evaluation

and reporting programme will be a 'step change' in aviation safety and he is enthusiastically circulating CAA's SMS information kits to his clients.

Steve Kern hopes the technology like Health and Usage Monitoring Systems (HUMS) and Helicopter Flight Data Management (HFDM) systems will be taken up as they become cheaper and more accessible to even small operators.

"HFDM can receive inputs from the engine and have an on-board camera in the cockpit", Steve says. "Information is stored on a memory chip and can be reviewed, say, following a competency check of a pilot. It can be used as a training aid and it can also monitor operational trends."

HFDM also offers better post-accident information than has traditionally been available for most helicopters.

"Airliners have flight data and cockpit voice recorders but very few New Zealand helicopters have that equipment."

"In the end," says Lloyd Matheson, "safety is good business practice. You can be cheap, but tourists want to know your safety record. Agencies who put out for tenders want to know if you've had accidents and incidents.

"And the new health and safety legislation will also improve things. Directors could be prosecuted for something their staff did. So they have to get up to speed [on safety] instead of just pushing the business side of things."

"The mavericks are on the way out," says John Fogden, "they're ageing and retiring and there are examples everywhere of guys who were pretty wild in their day, but who are now among the top operators.

"You get two pilots that both started as renegades, but one of them will have adapted to create a safe, financially successful showpiece. The other one is still playing in the sandpit and talking about the good old days." ■

An Aerospatiale Squirrel at the former US-NZ Hallett Station in East Antarctica. Mt Herschel (3,335 m) in background.

Photo courtesy of Murray Potter.



Dual Control Change

If you're a pilot wanting to remove and install dual controls, there are some requirements you need to meet.

A number of operators are not fully aware of their obligations when removing and reinstalling dual controls, in particular, the need for a duplicate inspection – see rule 43.113.

Regardless of aircraft type, dual control change is a maintenance activity. It must meet the rule requirements of Parts 43 and 91, and can only be done by a pilot who is authorised and trained, or a pilot who is the holder of a certificate of maintenance approval issued in accordance with Part 66.

Near Accident Avoided

Recently, during the fitting of dual controls to a Bell 206B Jet Ranger, the cyclic stick retaining pin assembly had not been used. The installation of this pin is a fail-safe method for ensuring the cyclic and collective sticks engage correctly.

Luckily, during the pre-takeoff checks, the maintenance error was identified. The cyclic stick moved within the stub providing the pilot with feedback that it had not been correctly fitted.

When questioned why the retaining pin assembly had not been used, the operator stated he didn't know the purpose of the pin.

The operator was previously involved in a similar incident. In this instance, a pin from the collective was left hanging loose and subsequently ended up jammed in the co-pilot's door.

"These two incidents stress the importance that authorised persons, or those holding a certificate of maintenance approval, are correctly trained and that a duplicate inspection is completed," says CAA Aviation Safety Adviser, John Keyzer.

"It's also important they have the technical data available, and closely follow the instructions given by the manufacturer when installing and removing dual controls."

To assess whether you are able to perform a dual control fit or removal, you can use the following information as a guide. It corresponds to the flow chart at the bottom of the page.

Does the manufacturer allow pilots to do dual control changes?

If **yes**, then a current pilot licence holder with an appropriate type rating issued under Part 61 (and other licence holders) can perform the maintenance listed in Part 43, Appendices A.1 and A.2.

This privilege is subject to certain conditions listed in rule 43.51 (b) and (c): namely, that the pilot must be trained by an appropriately rated licensed aircraft maintenance engineer, hold a written record of that training, and be authorised by the operator.

If **no**, then the licence holder will require a Part 66 Maintenance Approval from the CAA. To apply, you can use form 24066/03 on the CAA web site, www.caa.govt.nz, "Forms".

Is it covered by Part 43 Appendix A?

Part 43 appendices A.1 and A.2 list the maintenance activities that a pilot may be authorised to perform, and the associated conditions.

Any maintenance performed must be recorded. You can obtain free CAA400 Maintenance Record Sheets by emailing info@caa.govt.nz.

Change controls

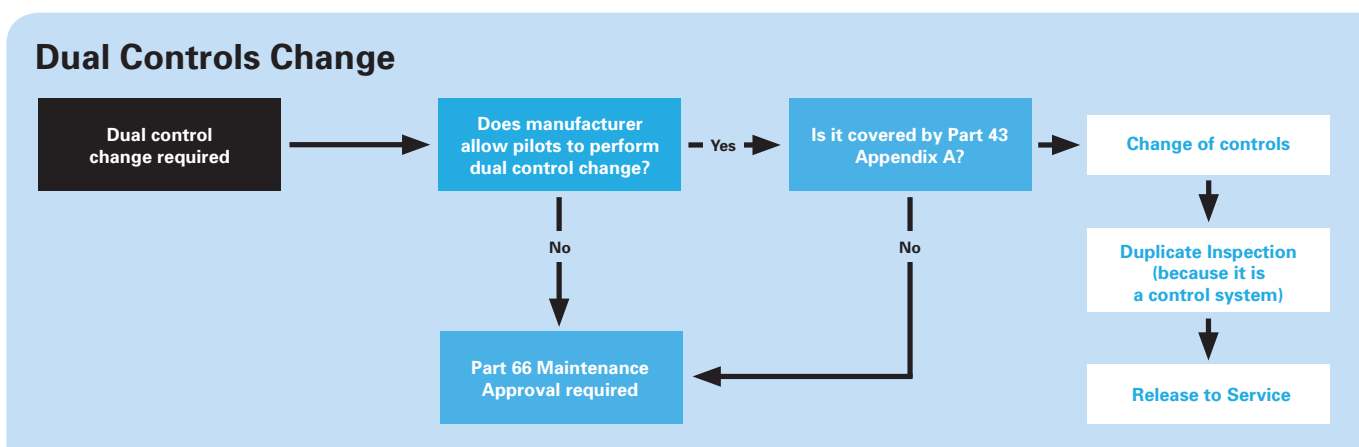
Ensure the control change is performed in accordance with correct acceptable technical data.

Duplicate inspection

As this maintenance work relates to a control system, a duplicate inspection must be completed and recorded by two persons, in compliance with rule 43.113 (b).

Release to Service

On completion of the maintenance, the pilot must certify a Release to Service in accordance with Part 43.105 *Certifying release-to-service after maintenance*. ■



Leaning Toward Good Fuel Management

Good leaning practice maximises fuel efficiency, and improves engine performance and longevity. It also contributes to a stress-free journey. But many pilots don't realise how important it is.

"I was doing an overhead join at Ardmore," says Warren Sattler, Chief Flying Instructor with Ardmore Flying School, "when a Stearman close to Clevedon put out a mayday call saying he was losing power and height, and was considering ditching in a paddock.

"I headed in his direction and suggested he try leaning the aircraft out. In doing that, he was able to get a few more revs and made it back to the airfield."

The story the veteran instructor tells is not uncommon. There are plenty of tales, even among experienced pilots, of suddenly finding they had far less fuel than anticipated, or of aircraft suffering what they thought was fuel starvation.

CAA's Standards Development and Training Officer, Carlton Campbell, says pilots trained at a sea level base and typically not operating above 3000 ft, are not leaning the mixture as a matter of course and often don't think about it.

Adjusting the mixture at altitude to maintain the balance of fuel and air in the engine allows the aircraft to perform with maximum efficiency and power.

But if there is too much fuel (over-rich) or too much air (over-lean) the machine will run rough with power loss. Ironically, a pilot with an over-rich, struggling aircraft might think of fuel starvation, pump more fuel through, and make the situation worse. On the other hand, repeatedly over-leaning may damage the engine.

Further, Warren Sattler tells the following story about how leaning can affect fuel economy:

"A few years ago I flew with a student from Ardmore to Whangarei in a Piper Tomahawk at about 5500 ft. The student

did not lean during that journey and while I was expecting us to use about 30 litres of fuel for that trip, we used 52."

While all experienced fliers will advocate the benefits of leaning, the trouble, as Carlton Campbell says, comes when you ask each of them how to do it.

"If you have 60 pilots in the same room you could get 60 different ways of doing it."

The best way to lean will depend on the aircraft. Some will require the pilot to lean by engine sound and reference to rpm, or by monitoring the exhaust gas temperature gauge. Others will allow the pilot to relax because the aircraft will do it automatically.

Both Warren and Carlton say that in the end, pilots should consult their aircraft Flight Manual.

But whatever you decide, make sure that as soon as you come level, leaning is front and centre of your operating practice.

Remember, if you experience sudden rough running and power loss, it might be nothing more than an unbalanced mixture. In these green and money-conscious days, leaning also means less fuel used and maximum range gained.

And finally, leaning is good for the health of your engine. More money saved!

Further Reading

The CAA's GAP booklet *Fuel Management* can be downloaded from the CAA web site, www.caa.govt.nz, or for printed copies, email: info@caa.govt.nz. ■



Flight Planning is No Time to Wing It

Flight planning is more than working out distance, time, and fuel. Good preparation minimises the risk posed by the unexpected.

First things first. Before you begin planning you need to ask yourself, 'is this flight within my capabilities as a pilot?' If 'yes', then you need to spend time gathering and interpreting information.

Rule 91.217 *Preflight action* lists the information that a pilot-in-command must obtain and become familiar with. This includes:

- » Current meteorological information;
- » Fuel requirements and considerations;
- » Alternate aerodromes available;
- » NOTAMS and Supplements;
- » Aerodrome conditions;
- » Aircraft performance data.

Route Selection



Don't just select waypoint A to waypoint B in the GPS and rely on blind faith.

Plan the optimum route for your trip on a Visual Navigation Chart (VNC) and make sure you consider:

- » The minimum safe altitudes for terrain you are flying over;
- » Aerodromes you will be flying near;
- » Airspace designation and its effect on traffic congestion. For example, take note of VFR transit lanes that tend to funnel traffic;
- » Refuelling options.

Then consider a practical route that takes into account those factors.

When planning on a VNC, check out what's shown (and not) on the difference scales. See www.caa.govt.nz, "Airspace."

Additionally, after you have picked your route, prepare a flight log with as much pertinent information as you can. You can fill in a lot of information beforehand and then finish the calculations once you have the up-to-date weather on the day.

Plan B

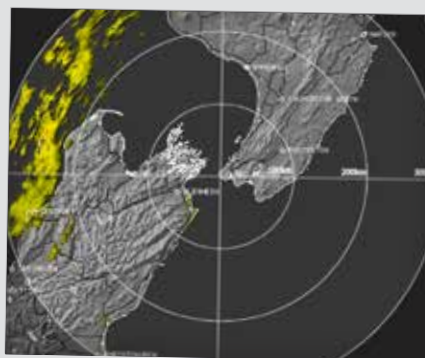


There was pressure to get the aircraft back, but Jenna's boss preferred her one day late, rather than dead on time.

While you complete your early stages of flight planning, it's worthwhile to make provision for at least one other safe alternative route. In planning that alternative, take the same level of care as you do with your primary route.

If you really need to attend an event and the weather doesn't cooperate, don't make a foolish decision by getting airborne in marginal conditions. Make sure you have a plan C – alternative transport. Bus, train, or airline services can be used as a backup.

Weather

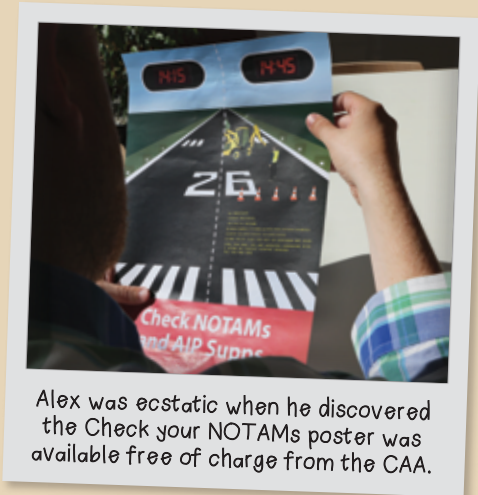


A forecast is a prediction, not a guarantee.

You can minimise the risks of being caught by bad weather by planning your flight well in advance. This will give you the opportunity to track the evolving weather situation, allowing you to make a more informed assessment of the weather forecast and current weather you obtain on the day.

On the day of the flight, you must obtain the most up-to-date weather before departing. You also need to leave enough time to interpret the information, especially when conditions are marginal.

Check your NOTAMs and AIP Supps



Alex was ecstatic when he discovered the Check your NOTAMs poster was available free of charge from the CAA.

Your flight planning should always include a check of the current NOTAMs (www.ifis.airways.co.nz) and AIP Supplements (www.aip.net.nz). These are provided free of charge.

Read them carefully and know the boundaries of the NOTAM areas – highlighting the ones that will affect your flight is a good idea. If you are uncertain about the contents of an airfield NOTAM, contact the aerodrome operator.

Also note that some Danger Areas, Military Operating Areas, and Restricted Areas are active only when advised by NOTAM – see *AIP New Zealand* ENR 5 for further details.

As well as NOTAMs and AIP Supplements, refer to the “Summer Traffic Busy Spots” reminder on the back cover of this issue for information on events where there could be lots of aircraft concentrated in the area.

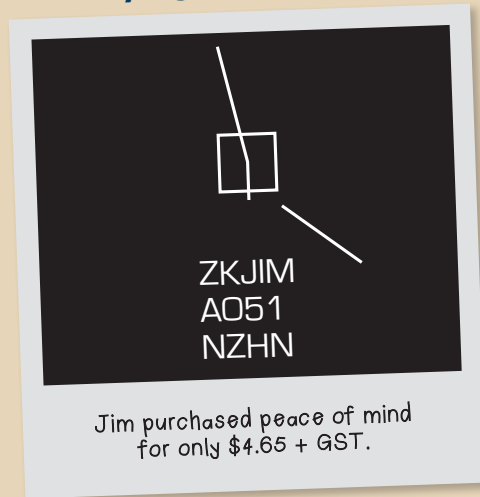
UTC Conversion



A simple planning error caused Charlie to get his ‘ECT sweat’ on.

‘A trap for young players’ doesn’t quite cover it – even experienced pilots make errors converting New Zealand Daylight Time (NZDT) to Coordinated Universal Time (UTC). When planning, remember that NZDT is 13 hours ahead of UTC during New Zealand Daylight Time.

Staying on the Radar



Jim purchased peace of mind for only \$4.65 + GST.

If you’re flying cross-country, you should file a flight plan with Airways (www.ifis.airways.co.nz). It’s quick, easy, and inexpensive. If you have filed a flight plan, and something goes awry during the flight, a process will begin that will maximise your chances of being found.

If you choose not to file a flight plan and instead opt to have a family member or friend provide flight following, make sure they are fully briefed on an emergency action plan.

Personal Minimums



Legal minimums are just a starting point.

There is a common tool to use when assessing minimums – the Personal Minimums Checklist. But this is only a mechanism for getting you thinking about what your personal limits should be.

You already have prescribed legal minimums, but you should also have personal minimums that may well be higher (or more restrictive) than the legal minimums. These will be the minimums you use to decide if you are going flying or not.

Personal minimums should be set on the day of flight by considering the day’s circumstances, like currency and competency, and not updated in flight unless absolutely critical, i.e. to avoid injury.

Got the Right Fuel Card?



On looking down, Jack noticed something fishy.

As part of your flight planning, check the AIP for who the fuel providers are at each aerodrome you plan on visiting. Check that you have the right fuel cards and that they haven't expired. You don't want to find yourself in a situation where you have to fly to another aerodrome with less fuel on board than you are comfortable with.

Be Prepared



A successful forced landing, but Geoff soon found he was ill-prepared for the subsequent trek.

It is important to have just enough of what would be really useful if you were to find yourself dumped in the middle of nowhere.

Make a list of what you think you should be carrying, then prioritise it in order of importance.

Here's a basic checklist to get you started:

- » Cellphone (charged)
- » Survival kit
- » Extra food and water
- » Life jackets
- » Suitable clothing and footwear
- » Credit card and cash.

Make sure you include all survival equipment in your weight and balance calculations.

Get your hands on a free copy of the *Survival Good Aviation Practice (GAP)* booklet by emailing info@caa.govt.nz.

It covers the power of being prepared – the importance of a positive mental attitude, understanding the priorities of survival, undergoing survival and first aid training, and discusses how to handle a variety of situations.

Talk to the Locals



After a quick chat with one of the locals, Sally grasped the nuances of Foxpine's RWY 27 approach.

Are you uncertain about airfield procedures or possible enroute weather conditions? Don't rely on '50/50' or 'ask the audience' – it's best to phone a friend. The advice from local operators may prove invaluable – most are very happy to help.

If enroute conditions on the day of the flight seem average at best, taking the trouble to make a short phone call may save you a lot more than time and money.

One Last Thing...



"ABC, Tower... take a look behind you on the apron".

Your Vol 4 left behind isn't going to help you – make sure you have everything, and that all hatches are closed.

On the day, don't forget to take a clean rag and windscreen cleaner. It's also prudent to carry spare oil.

If you plan on leaving the aircraft unattended, make sure you have the pickets and chocks to secure it. ■

Taking to the Skies this Summer

Winter's over and with longer evenings and better weather, we know you're just hankering to take to the skies again. But before you do, here are some reminders to ensure you're fit-to-fly this summer.

Weather Complacency

Summer doesn't just mean clear skies. The weather in New Zealand is always changeable and there can be strong and gusty winds, more pronounced sea breezes, aggressive thermals, and towering cumulus formations throughout summer – all with associated turbulence.

Always do a weather check as part of your flight planning. Use MetFlight GA, <http://metflight.metra.co.nz>, and include the ARFORs, TAFs, and METARs in your considerations. Combine these with your observations of actual conditions to form the 'big picture'. For more information, refer to the *VFR Met GAP* booklet available on the CAA web site, www.caa.govt.nz, or email: info@caa.govt.nz for a printed copy.

Charts Up-to-date

Are your charts up-to-date? New visual navigation charts effective 13 November 2014 can now be ordered from www.aipshop.co.nz.

Aeronautical Information Publication subscriptions for Vols 1-4, can also be purchased in hardcopy from www.aipshop.co.nz, or you can download them free at www.aip.net.nz.

Increased Traffic

With more aircraft in the sky over summer, you need to be aware of the increased traffic around you. And remember, while a GPS may get you from point A to B directly, it may not be the best, most scenic, or fun route to take. Also be aware that there may be others on the same GPS track as you. Check out the back page of this issue of *Vector* for some of summer's hotspots this season.

Daylight Saving

Another often overlooked aspect of summer flying is time. Summer means long evenings, and part of that is due to New Zealand switching to Daylight time in September until April. This means that during summer our time is 13 hours ahead of UTC rather than 12. Make sure you factor this in when making any flight plans, interpreting weather reports, and providing ETA or SAR times.

Carburettor Icing

Carburettor icing doesn't just happen in cold weather. In fact, humid summer days are more of a risk than cold, clear winter days as cold air holds less moisture than warm air. Carburettor icing should be expected when the outside air temperature is between -10°C and $+30^{\circ}\text{C}$ with high humidity and visible moisture present, but is most likely between $+10^{\circ}\text{C}$ and $+15^{\circ}\text{C}$, with a relative humidity above 40 per cent.

You must use your knowledge and experience to identify carburettor icing – the closer the temperature and dewpoint readings, the greater the relative humidity.

Grass Aerodromes

Landing on grass can be a bit of a challenge even in summer. Just because it's a beautiful day doesn't mean that the ground is as dry as you think it is and you may need more space than you think. You should also be aware that the length of the grass and how wet it is can affect the distance needed for both takeoff and landings.

Summer is synonymous with fly-ins in the aviation community. This was at the Sport Aircraft Association national fly-in at Hastings Aerodrome in March 2014.

Your Airworthiness

It's not just the 'plane that needs to be airworthy, but the pilot too!

If it's been a while since you last flew, perhaps take a ride with an instructor as a refresher?

Check out our online *Personal Preflight* course at www.caa.govt.nz/avkiwi. It's got lots of information to help you check out your fitness to fly.

Your Health

Are you stressed or fatigued? Your mental health is just as important as your physical health if you're heading into the skies. Also, make sure you're not impaired by alcohol or drugs, including prescription medicine.

You must report all medical conditions with any short or medium-term effect, as well as any changes in existing conditions. Under the Civil Aviation Act and rules, a pilot who experiences a known medical deficiency, an increase in a known medical deficiency, or a medically significant condition, must not return to flight duty until examined and certified by a designated medical examiner.

Dehydration

By the time you realise you're thirsty, you're well on your way to dehydration and its affects may have already started – from just being hot and sweating profusely, right through to a decline in peripheral vision and logical thinking.

All pilots need to be aware that dehydration impairs performance.

The best way to keep hydrated is to eat and drink regularly, and avoid diuretics like alcohol and caffeine. Drink around two litres of water every 24 hours, and ensure you've had a couple of glasses of water before you head off into the skies. On warm or hot days, it's especially important to be adequately hydrated, as you may quickly become dehydrated in a hot cabin environment.

Bird Nests

Spring sees the hatching of birds, so you should always check for bird nests under the engine cowls or in the fuselage. While the chicks may be cute, the nests pose a very real danger to flight safety. Depending on where they are, they could cause an engine to overheat, catch fire, or seize. Nests built in the fuselage or wing can foul the control cables and could result in a control surface jamming.

Thoroughly checking for bird nests during the pre-flight is essential, especially during spring and summer.

And Finally...

Are your medical certificate and your Biennial Flight Review current? If not, make sure you allow plenty of time to get up-to-date as this time of year is busy for everyone.

If applying for a licence, the same applies. Make sure your paperwork is complete, and get your application in with plenty of time before the holidays.

Happy flying! ■



Explaining Hood Happenings

Pilots visiting Hood Aerodrome at Masterton may notice a surge in unusual activity there during the summer, including 'randoms' on the taxiway. Be not alarmed! It's simply The Vintage Aviator pilots out practising their flying skills ahead of a bumper number of WWI centenary displays.

"The WW1 aeroplanes are challenging to fly," says The Vintage Aviator's Sara Randle, understatedly. "They have no radios, brakes, flaps, canopies, nor heaters. They have only basic instrumentation, a small rudder, and poor manoeuvrability on the ground. The airspeed of those with rotary engines is controlled by the ignition: basically the engine is switched on and off to regulate airspeed. Additionally, rotary engines operate a 'complete loss' oil system so the spent oil – castor, just as in WWI – is spat out of the engine and back over the aircraft... and pilot."

Sara is Operations Manager of The Vintage Aviator Ltd (TVAL) flying collection and wants pilots of contemporary aircraft to understand what they may be witnessing at Hood during the summer.

"We already have three air events to attend this season, plus we are taking a number of aircraft to Avalon in Australia, so our pilots are having to step up their practice hours."

Twelve pilots from around the country are descending on Hood during the last weekend of each month to fly the 39 vintage aircraft housed there. Some are originals – like the Bristol fighter, using the world's oldest airworthy Rolls Royce aero engine. Others are replicas, such as the Fokker Dr.1 triplane – favourite of the Red Baron – which look like originals but have modern components. The final group is what TVAL calls "continuation" aircraft. They've been built off the original designs to original specifications and of original materials. For instance, it really is Irish linen stretched over the skeletal wooden spruce framework of TVAL's 1913 BE.2s.

"There's a marked difference between flying these planes and modern planes," says Sara Randle. "While our pilots fly inside the rules and are good at interacting with other pilots at the aerodrome, we do need to let pilots of contemporary aircraft know what to expect.

That could mean on windy days, wing runners escorting the plane on the taxiway to hold the wings down and preventing the aircraft tipping over – or helping to steer the aircraft. Manoeuvring can be difficult, due to a fixed unsteerable wooden tail skid rather than a rear wheel, and the absence of brakes. Similarly, a vehicle may accompany aircraft on to the manoeuvring areas of the field during test flights.

The very limited ground control means the planes often warm up from the start position and go straight to the runway in use without negotiating taxiways. TVAL pilots will usually give way to other taxiing aircraft and wait for a clear path ahead before moving off.

Visibility is very poor on the ground owing to the cockpit positioning and the high nose/low tail attitude. If sightseers are wandering around the aerodrome's manoeuvring or apron areas getting a close look at TVAL aircraft, anxious ground crew will likely ask them to move away because they are so conscious of the pilots' difficulty in spotting people close by.

Limited visibility in the air caused by cockpit positioning and gun mounts is also an issue.

"We're pretty well versed on lookout procedures," says TVAL pilot Andrew Vincent, from Christchurch, "but like any other traffic situation, don't assume we've seen you.

"In terms of others seeing us, some of our aircraft use camouflage paint which can be difficult to sight. But I guess 100 years ago that was the point!

"The aircraft also have no electrical systems – so don't expect to see landing lights or wing tip lighting – and they operate NORDO procedures, so don't anticipate any radio communication."

The aircraft are very lightweight, are rarely operated in anything over 15 knots, and take only very limited cross wind.

TVAL General Manager and Test Pilot, Gene DeMarco, says the pilots try to conform to circuit operating procedures and the standard vector in use.

"But there are times when we cannot safely utilise the designated vector. That is especially so if the wind has risen unexpectedly during a flight. It is imperative that our aircraft land into wind.

"With no flaps and limited visibility, WWI aircraft fly a close-in circuit pattern and use side-slip in the final approach. That can sometimes place the aircraft out of other pilots' expected 'look out' area so they should check for our aircraft approaching from a close-in downwind/base-turn position.

"On sunny days they could look for their aircraft shadow to see if there are other shadows close by.

"Original and rare engines need some cossetting so circuit patterns are tight and close. If visiting pilots are flying wide patterns or extending downwind, they can expect us to take the number one position if we can do it safely. We aren't being cheeky but we are trying to ensure the survival of a 100 year old aero engine!"

In the landing phase, TVAL pilots are a mass of concentration, especially in windy conditions. Once airspeed has reduced, particularly during the landing and roll out phase, there is less air flow over the control surfaces. The aircraft is at its most vulnerable at this stage.

"If the wind changes, or does not favour a designated grass vector, WWI aircraft have to land like they did 100 years ago, directly into the wind. Using the designated vector with even a small degree of crosswind may cause the aircraft to ground-loop or tip over on landing. So pilots may opt to use the large grass manoeuvring areas of the airfield and may need ground crew to help them taxi back. Visitors should allow plenty of

space between themselves and the landing WWI aircraft in front of them," says Gene DeMarco.

Sara Randle suggests pilots planning to visit Hood check the AIP supplements for flying weekends, although weather doesn't always conform to supplement publications.

"If it's a calm day and the doors on the largest hangar are open, it's a pretty good indication we're flying."

"People want to see these aircraft in action and with increasing numbers being restored and built, more and more WWI aircraft are flying at Hood, so we do appreciate other pilots' understanding our operating limitations."

She says the TVAL pilots are happy to talk to other pilots about what they are doing.

"Our pilots are some of the most experienced tail dragger pilots in the country and come from a variety of flying backgrounds. Once practice is over, they are happy to talk to other pilots. Don't feel hesitant about approaching them!" ■



TVAL pilots in replica Fokker Dr.I Triplanes, from left to right John Bargh, Gary Yardley and Jerry Chisum, south east of Masterton.

©PhilipMakanna/GHOSTS.

Reporting **Bird Hazards**

We all know the dangers of birds around aircraft. Whether you strike a bird at 2100 feet in your Cessna 180, or have to make a miracle landing in the Hudson River in an A320 with 155 people on board, birds and aircraft don't mix.

As aircraft and birds share the same skies, we need to make sure the risk of bird strike is minimal. One of the most effective ways to achieve that is for pilots to report not only actual bird incidents, but any bird hazards, to the CAA.

Reporting hazards contributes to the 'big picture' – identifying where trouble spots are, what species pose the greatest danger, and what control measures may be appropriate.

What is a Bird Hazard?

A bird hazard is:

- » A significant population of birds living on or near an aerodrome.
- » Birds displaying erratic and unpredictable behaviour when disturbed by an aircraft.
- » Bird flight paths conflicting with aircraft flight paths.

Birds may be around aerodromes for various reasons, including feeding, breeding, or when conditions at their normal habitats are too rough.

Flocks of starlings are sometimes seen foraging for worms and grass grubs; plovers find that aerodromes make good breeding sites, and occasionally large flocks of gulls are seen resting on a runway during stormy conditions.

One major New Zealand aerodrome had problems with a large gull population moving between a rubbish dump several miles to the east of the field and another to the west. Fixing that required the cooperation of the local authorities to make the dumps less attractive to the gulls.

Hazard or Incident?

Essentially, a hazard is an incident waiting to happen. An incident is either an actual collision between an aircraft and one or more birds, or a near-collision. Being aware of hazards lessens their chances of developing into incidents.

A collision can result in serious damage to an aircraft, depending on the size of the bird and the speed of the aircraft at the point of impact.

But it's not just large birds that pose problems. Starlings, although small, have a high body mass in relation to their size, and are normally found in large flocks. For both reasons, they can be a significant hazard. In 1960, a Lockheed Electra in Boston crashed after ingesting starlings into all four engines resulting in 62 fatalities.



Photo credit: istockphoto.com/bigemrg

Reporting a Hazard

A bird **incident** must be reported to the CAA under rule 12.55(c). We recommend that you report all bird hazards, because that allows the CAA to identify patterns and areas where bird control is needed.

If you see a bird **hazard**, you should notify:

- » The nearest ATS unit without delay, so other pilots can be warned.
- » Pilots operating in the vicinity, and the aerodrome owner or operator if the aerodrome is unattended.
- » The CAA – it's easy using the online reporting system, www.caa.govt.nz/report (or you can fill in form CA005B and email to isi@caa.govt.nz, or fax: 04 560 9613).

More Information

The CAA's GAP booklet *Bird Hazards* can be downloaded from the CAA web site, or for printed copies, email: info@caa.govt.nz. ■

Part 115 Certification

Two years after the introduction of Part 115 *Adventure Aviation – Certification and Operations*, operators are now busy completing recertification and readying themselves for five more years of adventure aviation operations.

Jeanette Lusty, CAA's Team Leader Flight Operations Adventure Aviation, is delighted with the way the industry has picked up knowledge of the Part 115 systems and operations. "Part of the learning process in gaining certification has shown operators the importance of meeting the standards. There is also more understanding of the regulatory process," she says.

That view is echoed by participants. Mark Brown, of Kiwi Balloon Company, says, "You need to learn and know the rules, and how they impact on your company – you have to be aviation aware."

It was a similar experience for Brett Nicholls of Strikemaster Ltd.

"The recertification was more a procedure where we took time to rethink and refresh our views on our processes and our operation."

Brett says there is good awareness of the Part 115 certification requirement, both in the industry and among the public in general.

"Certification tells a potential client that the standard of the operation is high and that they are safe in our hands. So, why wouldn't you want to achieve certification?"

Jeanette says all sectors of the adventure aviation industry have embraced Part 115.

"Due to their prior airline experience, many pilots in the Warbirds sector have probably grown faster than anyone else in the other sectors, as they are already familiar with regulations and minimum standards in the certification system.

"A large part of the parachuting sector has good willingness and procedure. This sector includes some who have had past experience with Part 135 *Air Operations – Helicopters and Small Aeroplanes* and this shows in their business too.

"The ballooning industry has found that the fallout from the Carterton accident has affected their ability to market themselves and get work. More than ever before, this emphasises the need for a minimum standard for the industry through regulation," she says.

Mark Brown adds, "The only downside to the certification process has been the cost in a very declined market".

Trending Now

Rex Kenny, CAA's Manager Special Flight Operations and Recreational Aviation, says, "Two years of operation have revealed new trends and changing business models. Some operators have taken the move to the regulated environment as an opportunity to rebrand and remarket their operations, which has proved to be a wise decision. It is really good to see that they are putting in the effort and that it is paying off," he says.

Jeanette points to another welcome trend, "New operators wanting to get certificated are coming to us at the very beginning so that we can point them in the right direction. So a working relationship is being built even before they get their initial certification. We encourage you to contact us at the start – we're more than happy to help," she says. Email: Jeanette.Lusty@caa.govt.nz.

Brett has the last word, "Setting up to get certificated can seem pretty daunting at first. However, I would suggest just getting into it, get certificated and get on flying. Just take the bull by the horns." ■



Photo courtesy of Wendy Peel.

It's Never Been **Safer in the Air**

There's a cliché that says you're more likely to die in a car accident on the way to the airport than in a plane crash. And actually, in this case it's true!

While an air accident can end catastrophically – think AF 447, TWA 800, MH17 – the reason an air accident makes news is because they are so few and far between. Whether you're flying on a commercial airliner, in a private plane, or in a helicopter, it's probably the safest way to travel.

Following the Asiana Airlines crash at San Francisco in 2013 when three passengers were killed, Arnold Barnett, a statistics professor at the Massachusetts Institute of Technology, wrote in a column for CNN.com that, "a traveller could on average fly once a day for 4 million years before succumbing to a fatal crash."

While that figure is based on American statistics, it's almost certainly just as true for New Zealand.

In the year ending 31 December 2013, there were almost one million aircraft movements around New Zealand, with 115 accidents reported in the same year. That's a rate of 0.011 per cent of aircraft movements involving an accident.

Commercial Airlines

New Zealand has an enviable record in safety in commercial air travel. But even on a global scale it's never been safer to fly commercially. According to the Aircraft Crashes Record Office

– a Geneva-based organisation that compiles statistics on aviation accidents of planes capable of carrying more than six passengers – there have been fewer than 140 accidents every year between 2009 and 2013, compared with 211 accidents as recently as 1999. Annual fatalities have also fallen, with 265 in 2013 – the lowest since World War II.

Aircraft manufacturers continue to develop airliners with advanced avionics, providing opportunities for better navigation, surveillance, and safety in the air. This is part of the reason that we continue to see a fall in the number of air accidents involving commercial airlines.

Private Planes

While commercial aviation's impressive safety record is often touted, private flyers in New Zealand are also extremely safe.

The biggest sector represented in New Zealand's accident statistics is sport aircraft, with 54 of all 109 accidents across the aviation industry in 2013/14. However, given the number of sport flights every year, that number is absolutely miniscule. It gets even smaller when you look at the 17 serious injuries reported in recreational flying in 2012/13. This compares with 420,000 claims ACC accepted in sport and recreation in the same period!



Photo courtesy of Wellington International Airport Limited, showing an exceptionally busy time in 2011 during the Rugby World Cup.

New Zealand's adventure tourism industry attracts thrill-seekers from all over the world and aviation plays a big part in that. We have a reputation as a safe place to experience all that adventure aviation offers. Part of that safe reputation is driven by New Zealand leading the world in comprehensive regulation in the adventure aviation sector – there are now 27 certificated aviation operators in New Zealand. Other countries, such as Australia and the UK are looking for guidance on implementing similar regulations in their own jurisdictions.

But What About Helicopters?

Helicopter safety has improved exponentially over the years. For more about helicopter safety, check out the article on page 4.

So Why is Aviation So Safe?

The short answer is because participants in aviation are aware of the importance of safety and why the CAA enforces the rules it does.

The CAA's regulatory model is no longer one where minimum safety standards are simply met, but rather one where operators manage risk proactively. This risk-based approach is accepted internationally as a key determinant of better aviation safety outcomes. Following this approach should significantly improve aviation safety in New Zealand.

The CAA proposes the introduction of a requirement that certificated operators put in place an effective Safety Management System. Find out more at: www.caa.govt.nz/sms.

Aviation is a fast-changing industry, however, so rules need to evolve and change as the industry does. This is why the CAA

has a big focus on remotely piloted aircraft systems (RPAS) at the moment – it's an area that will see rampant growth over the next few years (see page 21 for more).

The Future

Aviation continues to get safer, and the next major milestone is the New Southern Sky – the National Airspace and Air Navigation Plan.

If implemented, the proposed plan enables technologically advanced aircraft to realise their safety and commercial potential, and is the culmination of several years of planning and preparation.

It's an ambitious programme that will modernise New Zealand's aviation system over the next decade. It will improve the efficiency of air traffic movements and allow much more accurate navigation as we move from ageing ground systems to satellite-based ones. Communications will be improved as will effective decision-making with increased availability of information.

For more than 10 million annual air travellers it will mean shorter journeys, improved safety, and lower carbon emissions. It will also lead to fuel savings, lower aircraft operating costs, and reduced capital costs.

So I've Got Nothing to Worry About?

'Yeah-nah.' Flying is an incredibly safe way to travel, and accidents rarely happen, but that's no reason to be complacent. Flying is so safe in New Zealand because Kiwi pilots know the importance of safety and the CAA works with them to ensure these safety standards are met. So while it's good, it could always be better, which is why the CAA continues to focus on safety to strive for the best. ■



GA Airport Security

On 13 October 2014, the Rt Hon John Key, Prime Minister, announced that the threat level to New Zealand had been raised from very low to low. This means a terrorist attack is possible, but not expected. It highlights the need for the aviation community to be vigilant – that includes you.

Avgas thefts, hangar burglaries, and aircraft being tampered with – General Aviation (GA) airports and airfields have their share of problems. The diverse nature of the GA environment means that there is no ‘one size fits all’ solution.

Constant vigilance pays off, says Debbie Suisted, CAA’s Senior Technical Specialist Aviation Security.

“There is no guarantee of absolute safety or security in combating acts of unlawful interference, or even simple acts of stupidity. As aviators, however, we have the ability to increase safety and security through our vigilance and actions.

“We need to create a culture where we question any unusual activity and report it. What may appear small could be part of a bigger picture. Without all the pieces, the picture will never be complete. If you see something suspicious, it is important that you report it – for example, to the Police,” Debbie says.

Here are some ways you can help to improve security:

- » Check and confirm the identity of anyone hiring or leasing an aircraft. Ask to see photo ID, their licence and current medical certificate. Examine the IDs for any tampering.
- » Be wary of people with legitimate-looking documents but without corresponding aviation knowledge.
- » Don’t leave keys in unattended aircraft. Store them in a safe and secure location.
- » Aircraft could be started without their key, so keep the aircraft secure in a locked hangar, or chain them to a

permanent tie-down point. You can also use wheel clamps or locks, control locks, and throttle locks.

- » If airside access is possible through your premises, there must be an established airside policy to effectively monitor and control access.
- » Let others know what’s going on – for example, if your aircraft is out of service or if you won’t be using it for long periods, let someone know.
- » If you see something unusual, do something about it. Observe the person(s) and report any suspicious behaviour or activity. Only approach them if your safety is assured. Contact the Police or, if it is a security designated airport, contact the Aviation Security Service.

Security Designated Airports

GA pilots sometimes fly into security designated aerodromes which have additional security requirements.

Anyone in a security area is required to display an airport identity card.

Pilots of private aircraft must have their pilot licence for identification, and it’s also a good idea to have a form of photographic ID, such as a driver licence.

Private pilots are responsible for escorting their passengers to and from the aircraft.

A person authorized to be in a security area is allowed to stay there only as long as they are carrying out a legitimate function, and must leave as soon as their work is complete. ■

Graphical SIGMET

Earlier this year, the CAA asked MetService to develop a graphical SIGMET for NZZC and NZZO Flight Information Regions.

A SIGMET (significant meteorological information) provides information about severe weather conditions (turbulence, icing, mountain waves, volcanic ash, tropical cyclone, etc). SIGMETs use latitude and longitude co-ordinates to describe the location of particular weather patterns.

While SIGMET wasn't necessarily designed for domestic operations – it is produced in an international standard codified format – it's clear the availability of supplementary graphical SIGMET (GSM) will make life easier for a number of pilots. GA and some commercial pilots, in particular, have had difficulty with the latitude/longitude co-ordinates in the standard text SIGMET.

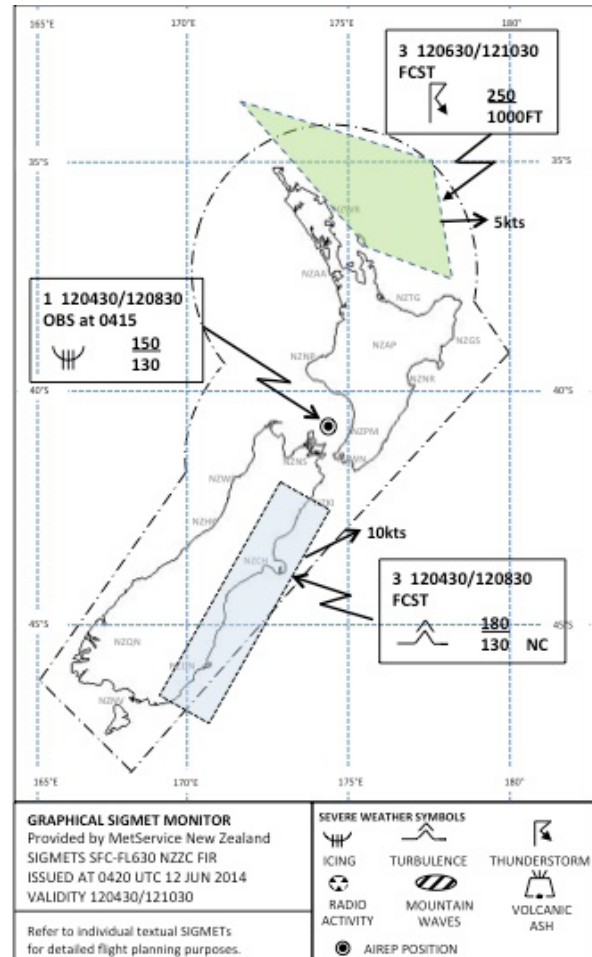
Implementation of the GSM is expected in early 2015. The GSM will be available through MetService web-based products, including MetFlight and MetJet.

What to Expect

The GSM will show the position of current SIGMETs with a single graphic and will update automatically as SIGMETs are issued and cancelled. Well established symbols will be used to show the nature and direction of weather patterns. MetService, using their new production and visualisation system, will be able to select areas of interest with greater precision.

Each SIGMET displayed on the GSM will also be accompanied by an issue and validity time. Latitude and longitude lines will be shown, as will Flight Information Region boundaries where appropriate.

Airways are devising a way in which Air Traffic Controllers can better pass SIGMET information to pilots in flight. ■



Indicative example of the developing Graphical SIGMET Monitor (GSM).

RPAS Proposed Rules Consultation

While there are Civil Aviation Rules in place for Remotely Piloted Aircraft Systems (RPAS), the growth in larger aircraft and demand for many commercial uses requires more tailor-made legislation. These aircraft are often called UAV, UAS, or drones.

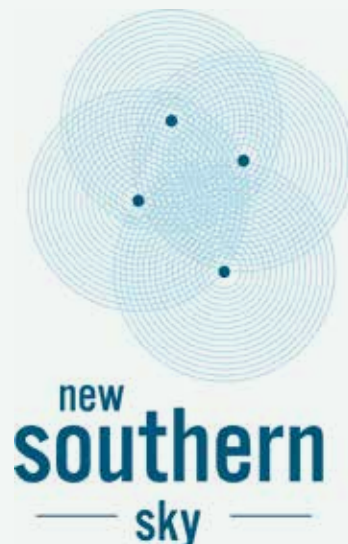
Now is your chance to participate in the rule making process. As this issue of *Vector* goes to print, the CAA is consulting on a Notice of Proposed Rule Making (NPRM) for RPAS.

The Parts affected will be Part 19 *Transition Rules*, Part 101 *Gyrogiders and Parasails*; and *Unmanned Balloons, Kites, Rockets, and Model Aircraft – Operating Rules*, as well as the creation of new Part 102 *Unmanned Aircraft Systems*.

The CAA has developed this proposal with the aviation community and welcomes submissions, before a final draft rule is submitted to the Minister for signing. The CAA publishes a summary of submissions so you can see what is happening throughout the process. To receive an email when any update about RPAS is published on the CAA web site, you can subscribe to its free email notification service.

See www.caa.govt.nz/rpas. ■

New Southern Sky – Performance Based Navigation Update



Changes have been made to compliance deadlines for the transition to Performance Based Navigation (PBN). These changes align with the New Southern Sky programme to modernise the aviation system. The extra time allows for wide consultation with affected operators and consideration of other factors, including changes to the ground-based navigation aid network and surveillance infrastructure.

That means that the deadlines published in draft Advisory Circular AC91-21 *Performance Based Navigation (PBN) – Operational Approvals* no longer apply.

The Advisory Circular development has been incorporated into the New Southern Sky programme, which is implementing the National Airspace and Air Navigation Plan.

PBN is being introduced in stages. By the end of 2015, new equipment and operator standards, guidance, training, and contingency strategies will be in place.

The revised dates for this development are:

- » February – March 2015. Discussion document circulated on issues and options.
- » June – July 2015. Rule and associated advisory circular consultation.
- » October – December 2015. Rule finalised and other policies implemented.

Operators will have the chance to provide input to the above process.

CAA Aerospace Programmes Manager, Ray Harvey, says it's important to make sure the transition is as smooth as possible.

"This modernisation means changes to the ground-based navigation aid network and surveillance infrastructure.

"We need to understand the whole picture before setting equipment standards and operating procedures for PBN, so we encourage operators to participate in the consultation."

Once new standards are in place, some operators may need to upgrade equipment and develop new procedures so they can continue using PBN routes.

Existing GPS IFR Enroute, Terminal and Non-Precision Approach operational approvals (as specified in aircraft 2129 forms and operator expositions) may continue to be used on RNAV 2, legacy RNAV (GNSS) SID/STAR, legacy RNAV (GNSS) Arrival, and legacy RNAV (GNSS) Approaches, until the new standards are in place. Existing GPS IFR approvals may not be utilised for RNAV1, RNP1 or RNP APCH procedures.

What is PBN?

Performance Based Navigation is area navigation that uses systems on board the aircraft to calculate its position in space while providing the crew with confirmation of the navigation performance of the aircraft.

Among the benefits are more efficient routes, better use of airspace, and lower fuel use.

That's in contrast to traditional navigation that uses receivers on the aircraft to guide it between ground-based navigation aids. Routes are limited by the number and location of available ground-based navigation aids.

The key to PBN is that the system must 'perform' to a rigorous set of requirements for the operations being flown.

In New Zealand, PBN is largely based on global navigation satellite systems (GNSS), but in some cases may be conducted with Distance Measuring Equipment (DME) combined with inertial navigation sensors.

Sole-means GNSS PBN operations are not currently permitted in the New Zealand Domestic Flight Information Region. Sole-means GNSS is being evaluated under New Southern Sky.

Operators already issued with interim RNP1 approvals can continue to operate on RNAV 1 and RNP1 SID/STAR procedures.

In the meantime, if you are planning to upgrade your navigation equipment or if you are unsure what your existing approval allows, contact the CAA Aerospace Programmes Unit for advice, email Ray.Harvey@caa.govt.nz.

To receive an alert about consultation and updates, subscribe to our free email notification service, www.caa.govt.nz/subscribe. For more information see www.caa.govt.nz, "Airspace – Performance-Based Navigation (PBN)".

To find out more about New Southern Sky visit www.nss.govt.nz. ■

CAA Triennial Funding Review Update

The CAA has completed analysis of just over 130 formal submissions, and 12 seminars in six centres around New Zealand, from the first round of the Triennial Funding Review consultation.

"We received submissions from a wide range of participants from all over the country. Most were well considered and some were quite extensive," says Graeme Harris, Director of Civil Aviation. "We thank those who attended a seminar or prepared a submission – or, in some cases both."

The CAA has discussed the analysis of specific options, and agreed on those that should progress to the financial modelling stage. The Ministry of Transport is leading the analysis of a proposed fuel levy option.

In mid-October, the Authority held a special meeting of the Aviation Community Advisory Group (ACAG) to get their views on our initial thoughts about submissions made during the consultation.

The Authority subsequently considered the feedback from the consultation along with the ACAG comment. Financial modelling of the options is under way.

The summary of submissions is available on the CAA web site: www.caa.govt.nz/funding.

How to Get Aviation Publications

AIP New Zealand

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

Pilot and Aircraft Logbooks

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

Rules, Advisory Circulars (ACs), Airworthiness Directives

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
22 Dec 2014	29 Dec 2014	5 Mar 2015
20 Jan 2015	26 Jan 2015	2 Apr 2015
16 Feb 2015	23 Feb 2015	30 Apr 2015

See www.caa.govt.nz/aip to view the AIP cut-off dates for 2015.

Aviation Safety Advisers

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

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Report Safety and Security Concerns

Available office hours (voicemail after hours).

0508 4 SAFETY

(0508 472 338)

isi@caa.govt.nz

For all aviation-related safety and security concerns.

Accident Notification

24-hour 7-day toll-free telephone

0508 ACCIDENT

(0508 222 433)

www.caa.govt.nz/report

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

Accident Briefs

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

ZK-CGJ Cessna 180A

Date and Time:	11-Feb-12 at 15:00
Location:	Upper Dingle
POB:	3
Injuries:	0
Damage:	Substantial
Nature of flight:	Private other
Pilot Licence:	Recreational Pilot Licence (Aeroplane)
Age:	71 yrs
Flying Hours (Total)	4655
Flying Hours (on Type)	3000
Last 90 Days:	27

While the aeroplane was landing, the left wheel struck a rock which was unseen in the grass. The left undercarriage assembly failed, allowing the left wingtip and propeller to contact the ground.

[CAA Occurrence Ref 12/557](#)

ZK-GKV Schempp-Hirth Nimbus-2

Date and Time:	15-Apr-12 at 15:30
Location:	Stratford
POB:	1
Injuries:	0
Damage:	Substantial
Nature of flight:	Private other
Pilot Licence:	Private Pilot Licence (Aeroplane)
Age:	53 yrs
Flying Hours (Total)	234
Flying Hours (on Type)	26
Last 90 Days:	15

On approach to land at Stratford Aerodrome, the pilot used insufficient airbrakes, resulting in a higher than normal airspeed/groundspeed. During the resultant long ground roll, the right wing contacted the ground, causing a ground loop.

[CAA Occurrence Ref 12/1643](#)

ZK-JBM TEAM Hi-Max

Date and Time:	06-Aug-12 at 10:44
Location:	Motueka
POB:	1
Injuries:	0
Damage:	Substantial
Nature of flight:	Private other
Age:	52 yrs
Flying Hours (Total)	65
Flying Hours (on Type)	6
Last 90 Days:	30

The aircraft was about 200 feet on final approach at Motueka when the engine failed. The pilot aimed to make a forced landing in a suitable paddock, but as the aircraft crossed the boundary hedge, a wing clipped some trees and it landed heavily. The cause of the engine failure is unknown.

[CAA Occurrence Ref 12/3316](#)

ZK-IBN Eagle R & D Helicycle

Date and Time:	11-Aug-12 at 17:20
Location:	Nelson
POB:	1
Injuries:	0
Damage:	Minor
Nature of flight:	Training solo
Age:	50 yrs
Flying Hours (Total)	24
Flying Hours (on Type)	1
Last 90 Days:	16

The student pilot was hover-taxiing the single-seat microlight helicopter, when it went into an uncommanded climb to about 40 feet above the ground. The pilot lowered collective and when the helicopter had returned to an acceptable height, raised collective to arrest the descent. The collective input failed to stop the descent and the helicopter hit the ground. The impact caused damage to the undercarriage and tail rotor.

[CAA Occurrence Ref 12/3463](#)

ZK-HMR Robinson R22 Beta

Date and Time:	31-Oct-12 at 18:30
Location:	Kaikoura
POB:	2
Injuries:	0
Damage:	Substantial
Nature of flight:	Private other
Pilot Licence:	Private Pilot Licence (Helicopter)
Age:	51 yrs
Flying Hours (Total)	404
Flying Hours (on Type)	404
Last 90 Days:	29

The helicopter encountered a tailwind on approach, resulting in an increased descent rate and unexpected rotor rpm decay. Despite applying power, the pilot was unable to arrest the descent and the helicopter struck the ground heavily.

[CAA Occurrence Ref 12/4894](#)

ZK-WAM Cessna 172R

Date and Time:	06-Nov-12 at 13:45
Location:	Raglan
POB:	1
Injuries:	0
Damage:	Substantial
Nature of flight:	Training solo
Pilot Licence:	Private Pilot Licence (Aeroplane)
Age:	57 yrs
Flying Hours (Total)	388
Flying Hours (on Type)	61
Last 90 Days:	8

While landing at Raglan Aerodrome, the aircraft bounced, at which point the pilot checked forward. The aircraft nose wheel contacted the ground and failed in a rearward direction, resulting in a propeller strike.

[CAA Occurrence Ref 12/4895](#)

ZK-GRT Schleicher ASW 27-18E

Date and Time:	27-Nov-12 at 15:23
Location:	Tapapa
POB:	1
Injuries:	0
Damage:	Substantial
Nature of flight:	Private other
Pilot Licence:	Airline Transport Pilot Licence (Aeroplane)
Age:	60 yrs
Flying Hours (Total)	514
Flying Hours (on Type)	202
Last 90 Days:	15

On a local flight, the pilot was obliged to make an out-landing when the sustainer motor would not start. About 35 metres into the landing roll, the glider struck a fence, damaging the canopy and wing.

[CAA Occurrence Ref 12/5389](#)

ZK-HSD Hughes 369D

Date and Time:	12-Dec-12 at 12:15
Location:	Hanmer Springs
POB:	2
Injuries:	0
Damage:	Substantial
Nature of flight:	Training dual
Pilot Licence:	Commercial Pilot Licence (Helicopter)
Age:	52 yrs
Flying Hours (Total)	3100
Flying Hours (on Type)	101
Last 90 Days:	20

In a practice autorotation, the pilot misjudged the flare height. The tail struck the ground, resulting in a broken tail rotor driveshaft and a rotor blade striking the horizontal stabiliser.

[CAA Occurrence Ref 12/5597](#)

ZK-IPY Robinson R44 II

Date and Time:	11-Jan-13 at 16:00
Location:	Glenorchy
POB:	3
Injuries:	0
Damage:	Substantial
Nature of flight:	Other aerial work
Pilot Licence:	Private Pilot Licence (Helicopter)
Age:	27 yrs
Flying Hours (Total)	1532
Flying Hours (on Type)	290
Last 90 Days:	32

A wind gust caused the main rotor to strike the tail boom during start-up, damaging the rotor blades as well as the tail boom.

[CAA Occurrence Ref 13/158](#)

ZK-BQV Piper PA-18

Date and Time:	02-Mar-13 at 12:00
Location:	Te Kowhai
POB:	2
Injuries:	0
Damage:	Substantial
Nature of flight:	Training dual
Pilot Licence:	Airline Transport Pilot Licence (Aeroplane)
Age:	54 yrs
Flying Hours (Total)	17414
Flying Hours (on Type)	2000
Last 90 Days:	246

The aircraft sank unexpectedly on short final, and the left undercarriage struck a fence post. On touchdown, the undercarriage collapsed and the aircraft veered off the runway.

[CAA Occurrence Ref 13/1011](#)

ZK-JBZ Czech Aircraft Works Sportcruiser

Date and Time:	26-Apr-13 at 17:45
Location:	Whitianga
POB:	1
Injuries:	0
Damage:	Substantial
Nature of flight:	Private other
Age:	60 yrs
Flying Hours (Total)	250
Flying Hours (on Type)	194
Last 90 Days:	10

The pilot flew from his farm to Whitianga Aerodrome to refuel his aircraft. He joined downwind for Runway 22, and due to the runway length, decided to land at the runway intersection. After landing, the length of the grass on the runway and the presence of a mown area to the left, led him to believe that the mown area was the runway. He veered the aircraft on to this area, and the aircraft ended up in a ditch on the side of the runway. This area was later found to be a model aircraft operating area, which had recently been mown.

[CAA Occurrence Ref 13/2189](#)

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

Pacific Aerospace 750XL

Control column bolt

ATA Chapter: 2731

During a parachute jump run, the pilot noticed unusual movement of the control stick. After the successful exit of the skydivers, the pilot returned to land and then investigated the movement. The bolt securing the bottom of the control stick into the control block had broken, allowing the stick to rotate and potentially come free of the block.

Investigation determined that the bolt failed as a result of low-cycle fatigue. To mitigate any further occurrences of this type of failure, the manufacturer issued Service Bulletin PACSB/XL/070 issue 2, dated 3 June 2014, and also developed a modification to prevent failure of the bolt. Airworthiness Directive DCA/750XL/15A was also issued, mandating installation of modification PAC/XL/0627 to prevent in-flight detachment of the control column due to possible failure of the attachment bolt.

[CAA Occurrence Ref 14/162](#)

Alpha R2160

Fixed leg

Part Model: R2160
 Part Manufacturer: Alpha Aviation
 Part Number: 60-32-011-001
 ATA Chapter: 3200
 TTIS hours: 3594.4

Both left and right main landing gear upper struts had cracks where the mounting bracket is welded to the cylinder. All cracks were adjacent to welds.

The struts were removed, magnetic particle inspection carried out, and cracks confirmed. Both struts were replaced.

Refer to CAA occurrence 13/6565 for a similar defect.

[CAA Occurrence Ref 13/6568](#)

Diamond DA 40

AHRS unit

Part Manufacturer: Garmin
 Part Number: GRS 77
 ATA Chapter: 3400

During climb after a touch-and-go, attitude, heading, airspeed and altitude indications were lost from the Garmin G1000 Primary Flight Display (PFD) about 100 ft agl. The pilot reverted to standby instruments, and completed the circuit safely.

Maintenance investigation found that the Attitude Heading and Reference System (AHRS) unit had failed, and the unit was replaced.

The faulty AHRS unit was returned to Garmin on exchange, but no further information is available as to the nature of the failure.

[CAA Occurrence Ref 14/1475](#)

Pacific Aerospace Cresco 08-600

Wing spar external strap

Part Model: PAC/CR/0317
 Part Manufacturer: PAC
 Part Number: 08-20443-1
 ATA Chapter: 5710
 TTIS hours: 8006

Cracking of the wing spar external strap was found during eddy current inspection for compliance with STC requirements. The programme is to inspect ongoing airworthiness of straps over the threshold hours until defects are noted or the upper hour limit is reached. Cracking originated from a single fastener on RH side, immediately outboard of the wing-to-fuselage intersection, in the second row of fasteners aft of the leading edge. The probable cause is fatigue cracking caused by cyclic flight and landing loads. The part was retired as per programme requirements, and a new item installed.

[CAA Occurrence Ref 13/6221](#)

Hughes 369E

Hook release cable

ATA Chapter: 2550

As the helicopter approached the application site during an agricultural operation, the pilot felt a sharp ascent, which was caused by an uncommanded release of the spreading bucket. The bucket was destroyed by ground impact.

The release cable outer conduit was found to have pulled away from the connector, which pulled the inner cable, releasing the load.

[CAA Occurrence Ref 14/413](#)

Hughes 369D

Collective support

Part Model:	369, 520, 600
Part Manufacturer:	Hughes
Part Number:	369ASK806-3
ATA Chapter:	6700
TSI cycles:	755
TSI hours:	97.15

During a 100-hour inspection of the flight controls, it was discovered that the collective support clamping assembly P/N 369ASK806-3 was cracked. The crack (about half an inch long) had formed on the upper clamp of the assembly near the aft attachment hole.

The engineer felt that the crack would have continued to propagate. Had the clamp failed completely, the bearing being retained would come loose and produce play in the system, but probably not to a degree where control would be compromised. It is likely that flight loads would hold the bearing in place in the event of a total failure.

The assembly was replaced with a serviceable item and the aircraft was returned to service.

[CAA Occurrence Ref 13/6033](#)

Hughes 369E

Tail rotor teeter bolt

Part Model:	500E
Part Manufacturer:	MD Helicopters
Part Number:	369A1602-3
ATA Chapter:	6400
TTIS hours:	9074.4

The pilot made a precautionary landing after a sudden onset of tail rotor vibration.

Engineering personnel discovered that the tail rotor teeter bolt was broken and the hole at the bush end of the respective TT (tension-torsion) strap was found to be oversized.

The hub must be removed at least every two years for access to the tail rotor swashplate for greasing. If the correct installation/removal procedure is not used, the threads of the teeter bolt abrade the teeter strap, resulting in an oversize hole. The bolt must be installed with the correct 'bullet' to prevent this condition.

If the hole is oversized, when the bolt is stretch torqued, the bolt is loaded at the point between the bush and the teeter strap assembly. This is due to the chamfer missing at the strap hole, causing the bolt to be point loaded.

This is the likely reason for the failure in this case.

[CAA Occurrence Ref 13/6220](#)

McDonnell Douglas 500N

Cargo hook

Part Model:	2AZOB
Part Manufacturer:	Breeze Eastern
Part Number:	17149-4

The pilot reported an uncommanded hook release. Subsequent investigation was unable to fault the hook mechanism. Further inspection at an overhaul facility also found no fault.

[CAA Occurrence Ref 13/5624](#)

Kawasaki BK117 B-2

Winch

ATA Chapter:	2550
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The winch system failed during retrieval of a medic and patient. The winch would run out when the pendant control was in both the 'out' and 'in' positions. The winch operation was stopped, and the medic detached from the hook. Control of the cable was established with the pilot's winch control, and the cable retrieved. The cable was found to have kinked 2-3 metres from the hook. The mechanism for this damage was not seen by the crew.

The operation was completed by another company aircraft.

Engineering inspection by the winch manufacturer found that the pendant had internal wear and tear consistent with operational use.

[CAA Occurrence Ref 14/1683](#)

Pacific Aerospace 750XL

Fin forward attach fitting

Part Model:	750XL
Part Manufacturer:	PAC
Part Number:	11-10281-1
ATA Chapter:	5340
TTIS cycles:	6026.7
TTIS hours:	1299

The vertical fin was removed for inspection of the forward fin attach bracket. The bracket was found to be cracked on the rear half of the fitting. The component was replaced, and concerns were raised regarding three other known occurrences. The CAA issued an AD (DCA/750XL/16) on 29 May 2014, revised to DCA/750XL/16A on 18 June 2014.

[CAA Occurrence Ref 14/1898](#)

Robinson R44 II

Fuel control unit

Part Model:	RSA-10AD1
Part Manufacturer:	Precision
Part Number:	2576630-4
ATA Chapter:	7320
TTIS hours:	1262

A significant engine power loss occurred on approach to a mountain landing site. The pilot was able to make an autorotational landing without damage.

The No 3 injector nozzle was found blocked. The fuel control unit (FCU) was inspected, with a thin opaque plastic-type material found coming from the mixture idle bush. The FCU was repaired, and all fuel lines were flushed and inspected.

This was the initial incident involving failure of a PTFE thrust washer on the idle valve side of the FCU. The washer (P/N 367757) was found to be delaminating/creeping and contaminating the fuel. The CAA issued Continuing Airworthiness Notice 73-003 and Emergency AD DCA/MA/17 as a result.

See also GA Defects 14/1994, 14/2672, and 14/2676.

[CAA Occurrence Ref 14/793](#)

Summer Traffic Busy Spots

Don't inadvertently fly into an aviation event – check your AIP Supplements for planned events near you. If you don't subscribe personally, you can download the AIP Supplements for free from www.aip.net.nz.

This map shows the known flying events between late November 2014 and mid-March 2015.



Keep these events on your calendar