July / August 2012

POINTING TO SAFER AVIATION

vector

Low Flying Zones

Drug and Alcohol Impairment

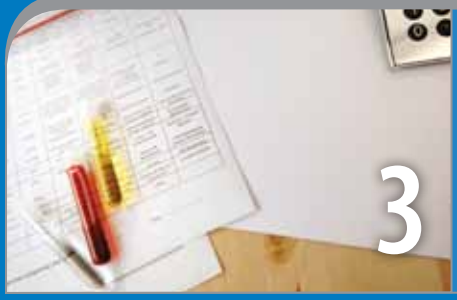
Plane Talking

Pilot Distraction

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

vector

In this issue...



Drug and Alcohol Impairment

Employers have responsibilities to protect people at work and others nearby from harm by managing known hazards. Impairment by drugs and alcohol is a serious hazard, so the CAA will be doing targeted audits to see how effective operators' systems are in managing this hazard.

Low Flying Zones

Do you control the use of, or sometimes operate in, a low flying zone? If you do, or plan to, then read this article for some tips on operating protocols and how to safely administer their use.

Plane Talking

Good communications are a critical element of aviation safety – correct and accurate information contributes to orderly sequencing, adequate separation, and collision avoidance. The recently-completed AvKiwi Safety Seminars delivered the *Plane Talking* message to 2624 aviators, and the article summarises the course content.

Pilot Distraction

I'm sorry, my mind was somewhere else. Distractions from subtle, or not so subtle, interruptions must be actively managed to prevent them from causing errors which can lead to accidents and serious incidents. This article looks at distractions and how they can be mitigated.

Cover photo: An example of the use of a low flying zone by two pilots flying a Citabria. See the article on page 4.

Published by
Safety Promotion Unit of the Civil Aviation Authority of New Zealand, PO Box 3555, Wellington 6140.

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

Published six times a year, in the last week of every odd month.

Manager Safety Promotion Bill Sommer.

Editor Peter Singleton.

The Vector Team
Alister Buckingham, Lakshmi Guda, Ken Mathews, Emma Peel, Rose Wood.

Design Gusto.

Publication Content
Unless expressly stated as CAA policy, the views expressed in *Vector* do not necessarily reflect the policy of the Civil Aviation Authority. Articles are intended to stimulate discussion, and nothing in *Vector* is to be taken as overriding any New Zealand civil aviation legislation, or any statements issued by the Director of Civil Aviation, or the Civil Aviation Authority of New Zealand.

Reader comments and contributions are welcome and may be published, but the Editor reserves the right to edit or abridge them, and not to publish those that are judged not to contribute constructively towards safer aviation. Reader contributions and correspondence regarding the content of *Vector* should be addressed to: *Vector* Editor, PO Box 3555, Wellington 6140, or email: info@caa.govt.nz.

Free Distribution
Vector is distributed automatically to all New Zealand flight crew, air traffic controllers, aircraft maintenance engineer licence holders, aircraft owners, most organisations holding an aviation document, and to certain other persons and organisations interested in promoting safer aviation.

In the case of flight crew and air traffic controllers, a current aviation medical certificate must be held, and a current New Zealand address given, to ensure magazine entitlement.

Holders of Pilot Certificates issued by Part 149 certificated organisations can also apply to receive a free *Vector* (see the CAA web site for details). *Vector* also appears on the CAA's web site: www.caa.govt.nz.

Change of Address
Readers receiving *Vector* free of charge should notify info@caa.govt.nz of any change of address, quoting your CAA Client Number. Paying subscribers should notify The Colour Guy.

Paid Subscriptions
Vector is available on subscription only from The Colour Guy, PO Box 30464, Lower Hutt 5040, Freephone 0800 438 785.

Photo: istock.com/peepo

Drug and Alcohol **Impairment**

Do you as an aviation sector employer, provide a continuous safe working environment for your staff and manage the known hazards? Impairment by drugs and alcohol is a serious hazard that you should also recognise.

This is important to protect your employees at work and others in the vicinity. There are legal obligations around this, and the CAA will be auditing organisations to see that appropriate measures are in place. We also provide sources of further information to help you manage your Health and Safety programme.

Employer Obligations

Under the Health and Safety in Employment Act 1992 (HSE Act) employers, the self-employed, employees, principals and others who are in a position to manage or control hazards, have obligations to not only identify workplace hazards, but to manage the ones that can cause serious harm. This is done to protect people in their place of work, and others in, or in the vicinity of the place, from harm.

The emphasis of the HSE Act is on the systematic management of health and safety at work, and requires employers and others to maintain safe working environments, and implement sound management practice.

CAA Action

Ed Randell, CAA Manager Health and Safety, says that the CAA has the responsibility to administer the HSE Act in the aviation sector.

"Over the next several months, the CAA will be doing targeted audits of the adventure tourism industry to see how identified serious hazards are being managed, and how effective operators' systems are in identifying and managing those hazards," Ed says.

The CAA action is in response to two recent Transport Accident Investigation Commission accident reports, which indicated the potential for safety concerns arising from the use of drugs by individuals in the adventure tourism industry.

The CAA is responding to the safety concerns the reports raised – there is no suggestion by the CAA that drug use contributed to those accidents. The action is to ensure that safety is not compromised and that organisations are complying with the HSE Act provisions.

"Drug and alcohol use is listed in the HSE Act as being a serious hazard in the workplace. The CAA will therefore be examining the effectiveness of the processes operators have in place to identify those hazards, and how they manage and mitigate impairment by drug and alcohol use.

"Using powers under the HSE Act, the CAA will in particular establish that operators have taken effective action in accordance with their responsibilities under the Act to provide a drug and alcohol impairment-free working environment," Ed advises.

Dr Dougal Watson, the CAA Principal Medical Officer, says, "Even quite low levels of alcohol and certain drugs can act to impair the human faculties required to fly in a safe and effective manner."

Help

To help operators develop systems to comply with the HSE Act, guidance material (snapshots of what others are doing) is available on the CAA web site, www.caa.govt.nz, "Health and Safety".

See Also

"Health and Safety" web site, www.osh.dol.govt.nz

"Drugs and Alcohol", May/June 2012 Vector, CAA web site, www.caa.govt.nz, "Publications – *Vector*" ■

Low Flying Zones

Low Flying Zones (LFZs) are specific pieces of airspace from the surface to 500 feet, established throughout the country for pilots to practise low level manoeuvres. They are mainly for flight training organisations to do pilot training.

Responsibility for the use of an LFZ is usually given to a flight school or aero club, and in this role they are called the 'using agency'.

Here are some tips for using agencies administering LFZs and for pilots using them.

Establishment

LFZs are established when the Director approves a location in accordance with the provisions of rule 71.163 *Low flying zones.* One of these provisions is that the Director must nominate a using agency to take responsibility for administering and controlling the use of the area.

To establish an LFZ, the nominated using agency must have the permission of the landowner, or owners if various properties are involved, below the portion of airspace to be used. The using agency must always be able to satisfy the Director that it continues to have the consent of the affected landowners.

A Recent Case

In a recent case when land ownership changed hands, the new owner was taken aback when he saw that aeroplanes and helicopters were doing low-level flying practice over his property, and some helicopters even landed. All this because the previous landowner had agreed to the creation of an LFZ over his property. The using agency had also ceased to exist, but pilots had continued to use the zone for low level practice, unaware of the changes.

This case raises several issues, in that if land changes hands, then the using agency must have the permission of the new owner to continue to use the area as an LFZ. If the using agency itself ceases to exist, then there is no responsible agency, and the provisions for establishing an LFZ cannot be met, meaning the area cannot be used for low flying practice. In such cases, the using agency must advise the CAA, so the LFZ can be temporarily or permanently disestablished.

Use

Pilots may use an LFZ provided they get a briefing from the using agency and comply with the Civil Aviation rules, and conditions of use of the zone in agreement with the agreement between the agency and the affected landowners.

Carlton Campbell, CAA Training Standards Development Officer, says that LFZs are important resources for pilot initial, recurrent, and transition training, to develop and maintain pilot low flying skills and competencies. The competencies can be for meeting licensing syllabus requirements, or for operational purposes.

"When low flying, the recognition of any threats, such as visual illusions or the stress experienced, is critical to the development of strategies that can mitigate such threats. Often overlooked is that each takeoff and landing involves a period of low flying," Carlton says.

Protocols

So how do I know if an LFZ is current and I'm able to use it?

AIP ENR 5.3 s2 *Low Flying Zones* describes an LFZ, and lists the LFZs and the various using agencies.

Of note is that some LFZs lie either wholly or partially within control zones (one is in a transit lane), so ATC clearances are required to operate in the affected sections of controlled airspace.

All pilots, including those outside the using agency, have the responsibility to always follow the rules, including the LFZ provisions and conditions of use. To help achieve this, open continuous lines of communication with the using agency must be maintained to ensure that there are no surprises.

Equally, the using agency has a responsibility to maintain an open relationship and channel of communication with the landowners. This will ensure that any changes in land usage or ownership are known and can be managed.

Carlton advises, "To maintain the continued availability of the zones, it is important for users to be respectful of any ground activity within an LFZ so that there is no insensitive or inappropriate use that could compromise the availability of the area.

"Contact protocols for safety and for the avoidance of nuisance factors are important. Open communication between the users of the area and the using agency is both prudent and polite.

"By maintaining a relationship with the landowners, the using agency can manage and mitigate the operational risks and hazards for all users. Some examples are the erection of new obstacles such as structures or wires, any temporary activity like topdressing, gliding, ballooning, or model aircraft operations, and any burn-off or blasting."

Carlton says that other examples of situations that would need to be managed with the landowners are when aircraft noise or movements could be disruptive during lambing, when stock not familiar with aircraft noise are present, during any filming activity, or during seasonal birdlife nesting.

The using agency must always be able to satisfy the Director that it continues to have the consent of the affected landowners.

Safety Procedures and Considerations

"The using agency must establish additional protocols and procedures for the prudent and safe management of the airspace for multiple aircraft use. This could include limiting the area to two aircraft at the same time, both on dual instruction, and using a common frequency, plus geographically separating helicopters and aeroplanes.

"Additional procedures should specify the requirements for solo operations if appropriate, the radio frequency and position reporting requirements when entering, using, and leaving the area, and any height restrictions. Detailing the known hazards, any weather and visibility restrictions, and operating time limits to prevent saturating the area that could affect landowners' goodwill, are also very important considerations," Carlton advises.

Merv Falconer, CAA Senior Technical Specialist Air Transport, says pilots operating in an LFZ must always have a bona fide reason for doing so, and comply with the rules.

"The rules require a pilot-in-command to ensure the safe operation of their aircraft and the safety of its occupants during flight, not operate in a careless manner, and not to cause unnecessary endangerment. Specifically, for pilots doing low flying training, rule 91.131 requires that they operate their aircraft without hazard to persons or property on the surface," Merv cautions.

Further Reading

On the CAA web site, www.caa.govt.nz, under "Rules":
Rule 71.163 *Low flying zones*
Rule 91.131 *Low flying zones*
Rule 91.311(d) (3) *Minimum heights for VFR flights* ■

That's Not Cost Sharing

A private pilot has been convicted and fined $1400, and $400 in court costs after taking paying passengers under the guise of cost sharing flights.

The pilot had been approached by potential passengers through his aero club, and had agreed to take them on 20-minute flights from the aircraft's home aerodrome to their destination, drop them off, and then fly the aircraft back to the aerodrome. He had made this kind of arrangement on several occasions, including return flights.

The pilot had charged the passengers for a share of the cost of the return journey, based on head count – hypothetically, if the return journey had cost $600, and he had carried three passengers, he would have charged them 75 percent of the cost, or $450. That's not cost sharing.

Under the Civil Aviation Rules, cost sharing is provided for, to allow pilots to share the actual cost of a flight with their passengers. Specifically, the rules require that the flight must not be advertised to the public, the crew member must receive no payment or other reward for the flight, and the cost must be shared equally among all those on board, including the pilot. Each passenger must not pay any more than their equal share of the actual cost of the flight. If these conditions are met, then the operation will not be for hire or reward.

The flights taken by this pilot did not meet these requirements for two reasons. In making the flights to the location and time that the passengers wanted to go (and that he would not otherwise have done), the pilot was essentially engaged, or hired, by the passengers – and in charging them for a share of the return flight, which he made alone, the pilot was being rewarded.

To his credit, this pilot pleaded guilty at the earliest opportunity, and that is reflected in the level of his fine, but this case serves as a reminder to all pilots.

In the New Zealand aviation system, paying passengers are protected by the higher safety standards provided by commercial pilot licence holders working within certificated air transport operations. This safety expectation cannot be circumvented by the cost sharing provisions, which are intended to allow pilots, including private pilots, to share the actual cost of flights they would otherwise have taken anyway, equally with those on board. ■

Plane Talking

AV KIWI SAFETY SEMINARS

The importance of good radio telephony (RTF) communication cannot be overstated – and there are some simple guidelines, which, if followed, can avoid misunderstanding, the need for repetition, and misinterpretation. In the worst case, these situations can lead to accidents, but in the main, they can cause a great deal of frustration, and not only for the parties directly involved.

Good radio use is definitely a hot topic for pilots and controllers alike, and this was reflected in a turnout of 2624 attendees over the 31 seminars, held throughout the country, from Invercargill to Kerikeri. Here's a summary for those who couldn't make one of the venues, and we also recommend you revise the Advisory Circular AC91-9 *Radiotelephony Manual* and read the GAP booklet *Plane Talking* (email info@caa.govt.nz).

Effective Communication

An effective radio call complies with the four Cs rule; that is, it must be:

» **Clear.** Others must be able to hear clearly what you say. Speak into the microphone, don't gabble or mumble, and use standard phraseology and correct grammar. Remember there are a lot of trainee pilots out there, and for some, English is not their first language.

» **Concise.** Say only what you need to say – and when you need to say it. Make sure you include all the necessary information, but don't embellish it with what you think would be 'nice to know'.

» **Consistent.** Be consistent, not only by using standard phraseology, but also the correct message order or structure. Adopt a standard pace, tone, and speech volume.

» **Correct.** Be accurate. Others may be relying on your accuracy for their own situational awareness. The expressions 'abeam' or 'approaching' somewhere are of no help, and must be avoided.

Know Your Equipment

There is a wide range of radio equipment in use, but the critical thing is that you know how to work what's in front of you now. If you can't figure it out by yourself, seek help – **before** you go flying. If your aircraft has an audio selector panel, an intercom, or both, work out how these interact. You may be faced with three separate volume controls, for instance: one on the set, one on the intercom panel, and one on the headset. Be careful not to confuse the transmit button with the intercom button.

The ideal pilot-radio interface is a headset with boom microphone, with the press-to-talk button on the control column, as this keeps the hands free. Adjust the mike so that your lips will just touch it when pursed, and when you use a hand-held mike, place it at the same distance when speaking into it.

Transmitting Technique

» There are several things to consider when transmitting, to ensure that your message is received correctly.

» Set the receiver volume and squelch level as required, and listen out before transmitting.

» Have your message organised (writing it down can help) before transmitting.

» Keep the mike at the same distance from your mouth – don't turn away while talking, and if using a headset, don't hold on to the boom.

» Use a normal tone and even rate of speech; be aware that the recipient may be writing down your message. Don't 'umm' or 'aah' your way through it.

» Press the transmit switch fully before speaking, and don't release it until you have finished. Sounds basic, but have a listen for clipped transmissions next time you fly.

Use of a headset will often give you 'sidetone', that is, you can hear your own voice as you transmit. This can be very useful for getting your speech volume and cadence right.

Radio Discipline

Sound professional – even if you aren't a professional pilot. If you are, however, you should be setting the example, by avoiding non-standard phraseology, jargon and wordy phrases such as "in receipt of" instead of "received".

Don't abbreviate your callsign – using the last two letters of the registration can be confusing. Gliders and helicopters generally have only the last two letters of G- and H-series registrations marked on the aircraft, so use of the full callsign will be an indicator of aircraft category at least.

Listen out before transmitting to avoid butting in on someone else's transmission. And to help with effective listening, you can work out a system, such as holding up your hand to tell your passengers when the radio requires your full attention.

There are a couple of aids for message formatting. The first is the **four Ws:**

» **W**ho you are calling, eg, Christchurch Information, Napier Tower, Waimate Traffic.

» **W**ho you are – your callsign. Prefixing with your aircraft type can assist others with recognition and expected performance.

» **W**here you are – accurate position report including time (where appropriate) and altitude.

» **W**hat you want – a clearance, what your intentions are, or weather information for example.

The second is useful for your position reports, **PTA-ETA**. That is, Position – Time – Altitude – ETA, and intentions if applicable.

Letters, Numbers and Standard Phrases

These are detailed in both AC91-9 *Radiotelephony Manual* and the GAP booklet *Plane Talking.* If you are not 100 per cent familiar with these standards, there's only one way to fix that!

Never be afraid to use SAY AGAIN, UNABLE, or STANDBY when necessary.

Writing it Down and Reading it Back

If you're having a bad day, sometimes a clearance might be delivered faster that you can assimilate it. Using clearance shorthand can help, and this can also be found in the AC and GAP.

Know what clearances and instructions must be read back – reading back unnecessary items wastes everyone's time, as does failing to read back essential items.

Air Traffic Services

There are several 'levels' of ATS, and the agency you will be communicating with depends on what airspace you happen to be in. Some control, some don't. The services most commonly used by GA pilots would be aerodrome control and area flight information. Spare a thought for the helpful officer on Christchurch Information, who monitors 14 frequencies simultaneously. You may hear the Flight Information Officer (FIO) talking, but not necessarily the other half of the conversation – it may be an aircraft at the other end of the country. If the FIO doesn't reply immediately to your initial call, wait a bit before trying again, as they might be copying a message on another frequency. With a bit of common sense, you will generally be able to tell when the FIO has finished a conversation, and time your initial call appropriately.

If planning on entering controlled airspace, organise your thoughts well in advance, and don't leave requesting a clearance until you're right at the airspace boundary. Stick to the four-W format for your request, as the controller will be noting the details, and a predictable order makes life easier for all concerned. Always have an alternative course of action, however, if a clearance is not available.

Uncontrolled Airspace and Unattended Aerodromes

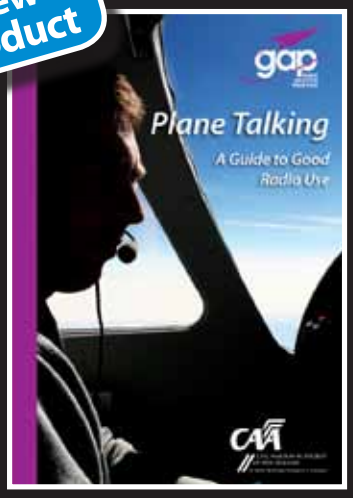
Anywhere, at any time, you should know the appropriate frequency to be operating on – whether inside or outside controlled airspace. Even outside controlled airspace, there are mandatory broadcast zones (MBZ) and common frequency zones (CFZ) to consider. In an MBZ you **must** be on the designated frequency, and in the CFZ you **should** at least be listening out on the frequency.

Charging around everywhere with your radio set to 119.1 MHz just doesn't work anymore – it's no longer the 'universal' frequency. Unattended aerodromes within an MBZ or CFZ generally use that area frequency as the 'unattended'

Paraparaumu Flight Service

Photo: Andrena Davis

New Product



Plane Talking

Now is a good time to review your RTF standards and make them even better, as new help is at hand. The CAA's latest Good Aviation Practice (GAP) booklet *Plane Talking*, is a handy guide to good radio operating practice, and covers the basics of good RTF, equipment, and techniques.

Some of the topics the booklet covers are: the international phonetic alphabet and standard phraseology, clearance shorthand, VFR flight plans, SARTIME, operating at unattended aerodromes, troubleshooting, and conditional clearance.

The booklet also has a chapter on the different levels of Air Traffic Control and the information they provide to pilots.

Plane Talking should be read in conjunction with Advisory Circular AC91-9 *Radiotelephony Manual* (available on the CAA web site, under Advisory Circulars).

Email: info@caa.govt.nz for a free copy of the GAP booklet.

frequency. All unattended aerodromes with charts published in *AIP New Zealand* have an assigned frequency; usually only those outside any designated airspace will use 119.1 MHz. Even then, make sure.

At an uncontrolled aerodrome (and that includes aerodromes with aerodrome flight information service), you are responsible for your own sequencing and collision avoidance. Lookout, 'listenout' and good RTF practices are crucial to safe operation. Make clear and accurate calls, which will assist other pilots with situational awareness. It is also good airmanship to repeat the name of the aerodrome in the transmission, as often the aerodrome name can be clipped and the call becomes meaningless. For example:

» *"Waimate traffic XYZ downwind two two Waimate" instead of "(gibberish) traffic XYZ downwind"*

Be aware also, that even though you don't hear any other traffic, that doesn't necessarily mean there is none. There could be NORDO aircraft in the area, as well as others on the wrong frequency, with comms failure, or some not even bothering to speak up. This highlights the importance of maintaining a good lookout at all times.

If you are operating at an unattended airfield used by IFR traffic, it pays to learn what calls to expect from the IFR aircraft, and what they mean. There are examples in the GAP booklet, and also the article *The Language Barrier* in the September/October 2011 issue of *Vector*.

For IFR pilots operating into these aerodromes, think about what your radio calls mean to other pilots in the area. For a start, speak clearly and at a rate that can be understood by someone in a noisy cockpit, with an ancient radio. Your position calls should relate to the aerodrome, rather than "established on the arc", "beacon outbound" or other phrases that are meaningless to the VFR pilot. For example, a pilot on the Wanaka RNAV (GNSS) A approach, rather that reporting at JOLLY, would be more helpful reporting "seven south-east Wanaka, 3800 feet".

When it All Goes Wrong

There are handy checklists in the GAP booklet on how to deal with comms failure, whether in your aircraft equipment or at the ATS end. An advance working knowledge of these will help when the problem strikes. It could be simply 'finger trouble', such as turning down the receiver volume and forgetting to turn it up again, or something more serious such as a popped avionics circuit breaker.

If in difficulty or actual distress, do not be afraid to speak up early while you still have options. Use the keywords, PAN PAN or MAYDAY – whichever expression is appropriate should be spoken three times (once can be easily missed). There is a preferred format for a distress message, but if you can at least transmit MAYDAY three times, your callsign, problem, intentions and position, there will be a good chance that help will be forthcoming.

Use backups to the distress call, including setting your transponder to 7700, activating your ELT, and activating any tracking system you may be using. Again – take these actions as early as you can while you are still in reception coverage. Remember that when you activate the ELT, it takes about 50 seconds before the first valid data burst is transmitted.

Aviate, Navigate, Communicate

Always in this order, although the communication element is still very important. Making your radio communications clear, intelligible and precise will help immensely when you already have your hands full with the other two. Forethought and practice will achieve this.

For further information, refer to the GAP booklet *Plane Talking*. ■

The availability of fresh resources, in the form of the GAP booklet, and the interactive course on CD, makes this an ideal time for Chief Pilots and Chief Flying Instructors to review the RTF standards of their teams. In an ideal world, there should be no variation in standards throughout the country, but at present there is much room for improvement – even in the professional pilot ranks. You can now buy copies of the Plane Talking Radio Course on CD for $20 (incl GST) plus post and packing. See www.caa.govt.nz/safety.

Photo: Andrena Davis

Consider having a prearranged signal to let your passenger(s) know when the radio requires your full attention

Whodunnit?

It's on-going and often a mystery.

Sometimes, an illegible signature or a few scrawled figures are all the CAA has to go on when they receive aircraft operation statistics forms from owners or operators (like the form pictured here). There is no client number, aircraft registration mark, operator name or any other information provided, that can be used to identify the aircraft operator so that the information can be entered into the CAA systems.

Jacob Halliburton, CAA Safety Information Specialist, is one of those tasked with entering the information from such returns (and others) into the CAA systems.

"We try to match the handwriting or look up all the aircraft owners with that number of aircraft, and try all the things we can possibly think of. But it can be really frustrating when after all that time and effort we sometimes still can't use the information because we haven't been able to identify the operator or the aircraft," Jacob says.

Keeping it Simple

The Intelligence, Safety and Risk Analysis team have just two simple requests for all aircraft operators:

» Fill in at least the required fields on the aircraft operations statistics form (this takes just a few minutes, especially with your completed and up-to-date logbook in front of you); and

» Write legibly.

For detailed information on **how** to fill in the form, see the *Vector* issue of Nov/Dec 2009, page 20, *Doing Much Flying?*, available online at www.caa.govt.nz, "Publications – Vector".

Here's Why

Your aircraft hours do matter. All aviation statistics are based on rates and without accurate flying hours, the rates cannot be accurate either. If the rates are not accurate, then the CAA cannot focus its safety efforts on the areas that actually require them the most.

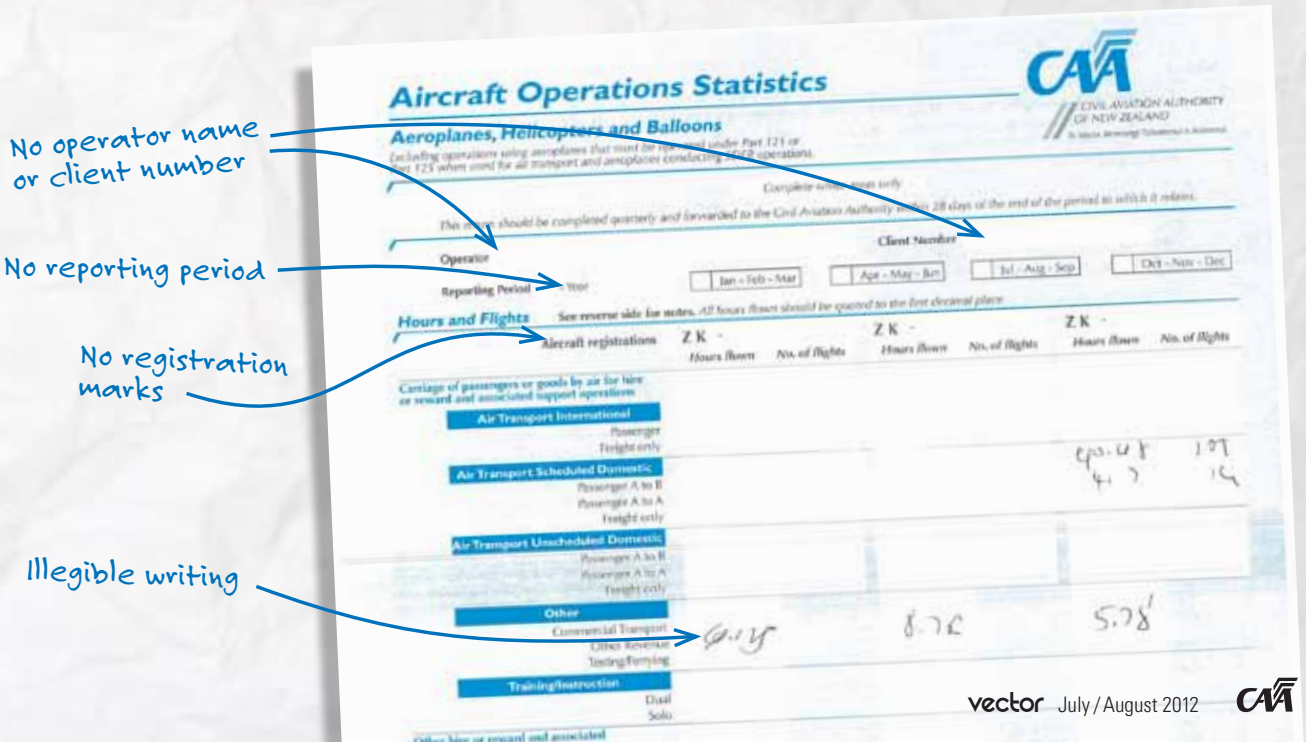
Under the Civil Aviation Rules, Part 12 *Accidents, Incidents, and Statistics*, you have a legal obligation to submit the aircraft operations statistics forms on a regular basis. When reported hours are not received from aircraft operators, the CAA assigns them an estimated number of hours. This is a conservative guess. If too many operators within a sector don't report, the result may be an underestimate of the hours flown by that sector. When the number of accidents is combined with the under-reported hours, the accident rate (accident/flight hours) for that sector appears to be higher. Under a risk-based regulatory model, high accident rates direct CAA resources. Part 12 is available on the CAA web site, under "Rules" (refer to *Subpart D – Statistics,* Rule 12.151 *Aircraft Operating Statistics*, under Part 12).

The CAA sends out reminders only after the reporting time grace period has passed, so don't wait to be told. It is the operator/owner's responsibility to remember to regularly complete the aircraft operations statistics forms and send them to the CAA.

For private owners not operating for hire and reward, the reporting date is 15 February. Here's an easy way to remember – that's the day after Valentine's day.

It's Easy Online

The CAA605b form is available online in MS Word™ format. You can download it, complete and return it electronically (send to stats@caa.govt.nz). You can also contact the CAA at this email address if you require any assistance on filling in aircraft operations statistics forms – the Intelligence, Safety and Risk Analysis team are more than happy to help.



Pilot **Distraction**

Keep it down please, I'm trying to concentrate. Now, where did I put my situational awareness? I know I had it had it just before I got that text message, and the flight attendant questioned me about tomorrow's boat trip.

Interruptions and distractions during critical phases of flight are considered by leading safety investigation agencies to be among the major causes of errors leading to accidents and incidents. Unless robust, well-maintained systems are in place and applied to mitigate interruptions and distractions, then errors can occur.

Recent Examples

In 2010, during an approach to land at Singapore, the experienced flight crew of a commercial airliner forgot to lower the landing gear because the captain allowed himself to be distracted by his cellphone. The crew had turned the autopilot off for the descent, and at about 2000 feet the captain's cellphone started receiving messages. The captain then became preoccupied with trying to unlock his phone to turn it off. Despite various cockpit warnings from about 700 feet, the aircraft did not climb away until it had reached 390 feet.

The airline chief pilot said, "Pilot distraction meant all the landing checklist items weren't completed before the aircraft passed an altitude of 500 feet, at which point a go-around was required under our operating procedures."

In 2009, a commercial airliner in the United States, cruising at night at FL370, overflew its destination by more than 100 NM. The two pilots had each been using their personal laptop computers, contrary to company policy, and lost situational awareness when they become distracted in conversation about rostering. They didn't maintain radio communications with a series of successive ATC units for well over an hour, and flew through six successive control sectors. Only after an inquiry from the cabin crew about the expected arrival time did they realize their error.

Cellphones

Merv Falconer, CAA Senior Technical Specialist Air Transport, says cellphones are a known source of distraction, and cites three fatal accidents in New Zealand in recent years that involved the pilot using a cellphone (texting and talking) at, or immediately prior to, the time of the accident.

"In another recent case during a short VFR flight, a passenger became concerned and complained to the operator about the pilot's behaviour of continuously texting on his cellphone while he was flying.

"Rule 91.7 *Portable electronic devices*, prohibits the use of cellphones on aircraft operating under IFR, but there is no such rule for VFR flight. However, common sense and good aviation practice says to avoid using them on VFR flights, especially within 500 feet of the surface and during critical flight phases, and other periods of heavy workload," Merv says.

Because of these examples, which suggest a wider industry problem, Merv

has recommended a rule change to limit the use of cellphones during critical stages of VFR flight.

The Issues

Interruptions and distractions are the main threat facing flight crews, according to an international task force mission to reduce approach-and-landing accidents.

A threat is defined as a condition that affects or complicates the performance of a task, or compliance with applicable standards. The condition can be created by the operating environment, which may induce omission errors, and inadvertent actions. The omission of an action, or an inappropriate action, has been identified as the most frequent causal factor in incidents and accidents.

Interruptions and distractions, such as ATC or other communications, and cabin attendants entering the cockpit, occur frequently. Some cannot be avoided, whereas others can be minimized or eliminated.

Interruptions and distractions in the cockpit may be subtle or momentary, but all can be disruptive to the flight crew. According to a NASA study, interruptions or distractions usually come from four primary sources:

- communications
- head-down activity
- responding to abnormal conditions or unanticipated situations
- searching for traffic after an alert.

The Effects

International studies have shown that the main effect of interruptions and distractions is to break the flow of ongoing cockpit activities, such as following standard operating procedures, performing checklists, communicating, monitoring, and problem-solving activities. The diverted attention can leave the flight crew with the feeling of being rushed, and faced with competing or pre-empting tasks. Consequently, because of natural human limitations when faced with concurrent task demands, performing some tasks to the detriment of other equally, or more important, tasks can occur.

The disruption and lapse of attention can result in pilots not properly monitoring their flight path, missing or misinterpreting ATC instructions, omitting actions, failing to detect abnormal conditions, and experiencing task overload.

Management

Peter Underwood, CAA Manager Air Transport Flight Operations, says that all airline expositions have a sterile cockpit policy to manage and mitigate interruptions and distractions.

"A sterile cockpit environment means that crew do not engage in any non-essential activities, including conversations, during critical phases of flight. This normally means from pushback at the gate until passing 10,000 feet on climb, and on descent through 10,000 feet during approach and landing, until the aircraft taxies to a stop at the gate. When a sterile cockpit philosophy is properly practised, distractions from non-safety related activities are minimized," Peter advises.

The Rules

Rule 121.503 (d) (large aeroplanes) *Crew Member Requirements*, says that each holder of an air operator certificate shall ensure that flight crew members perform only those duties that are essential for the safe operation of the aircraft, during critical phases of flight.

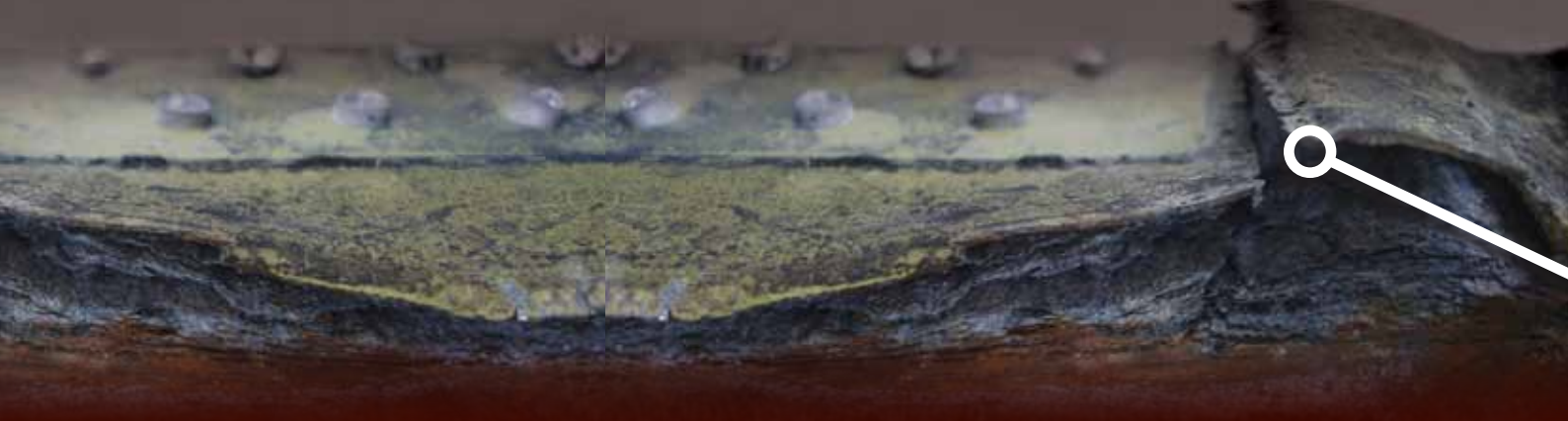
Rule 125.503 (d) (medium aeroplanes) *Crew Member Requirements*, says that each holder of an air operator certificate shall ensure that flight crew members perform only those duties during ground operations, takeoff, approach, and landing, that are required for the safe operation of the aeroplane.

Merv says, "Even though the rules for small and Part 91 aircraft operations don't specify the same requirements, it makes good safety sense for all operators to adopt and apply a sterile cockpit philosophy to manage the risks associated with interruptions and distractions, during critical phases of flight."

Further Reading

NASA – ASRS web site:
http://asrs.arc.hasa.gov ■

Photo: istock.com/TommL



Above: A graphic example of gross corrosion in a Cessna 180/185 landing gear outboard support bracket.

Ageing Aircraft

How old is too old? With aircraft this may be somewhat subjective, but with increasing age comes age-related airworthiness problems that need to be addressed. The average general aviation aeroplane is now approximately 37½ years old, and the average helicopter is around 20 years old, according to the CAA database.

John Bushell, CAA General Aviation Airworthiness Team Leader, wants to make it clear that the CAA supports the ongoing operation of ageing aircraft, provided those operations are done safely, and the aircraft are maintained so as to identify and correct any age-related problems.

The Problems

"With ageing aircraft, they seem to have a habit of developing new problems, and finding new ways to fail," John says.

In a recent example, a maintenance engineer discovered a significant crack in a hidden structural area of an older aircraft because he took a closer look than usually required at the time.

"Just like any apparatus or piece of machinery, there are many issues that can materialize with aircraft as they get older. These issues can include airframe stress, fatigue cracking, electrical and other systems deterioration, and corrosion.

"For example, electrical systems insulation can break down over time, wiring can become brittle and contacts can corrode and erode. Some old insulation can even emit toxic fumes in the event of a fire.

"Another concern is that fatigue cracking has demonstrated a horrible characteristic of accelerating exponentially with age, and can become a major airworthiness problem – even over months, or shorter periods of time. Another area to consider, is the ageing deterioration of fabrics and composites, or other non-metallic materials used extensively on some aircraft types, including balloons and parachutes," John says.

Maintenance Responsibilities

Rule 91.603 *General maintenance requirements*, says that the operator of an aircraft must ensure that the aircraft is maintained in an airworthy condition.

John cautions that as an aircraft owner or operator, there are various things you need to be aware of, and take responsibility for, to keep your aircraft airworthy.

"Owners need to understand the difference between maintenance and airworthiness, be aware of their responsibilities, and ensure that engineers take a closer look at the aircraft structure and systems to ensure the aircraft remains in an airworthy state.

"Never assume that regular maintenance is all that it takes to keep your aircraft airworthy. An essential point to remember, is that just because your aircraft is properly maintained in accordance with the manufacturer's schedules, it may still be non-airworthy. This occurs because old aircraft may have outlasted the maintenance systems created for them. The original maintenance documentation that came with the aircraft when it was new will have assumed a finite design life of maybe 20 years.

"A number of aircraft still flying will have now passed that assumed design life by some distance, and the original maintenance data may no longer be adequate or comprehensive enough to take into account ageing aircraft issues," John says.

Knowing how to effectively manage ageing aircraft is an essential maintenance and safety consideration. Understanding some basic concepts such as predicated reliability, the importance of proper fatigue inspections, the different types of corrosion and how they impact on structural integrity, and how wiring, fabric, composite, and functional system deterioration occurs, are all important considerations for proper maintenance.

Corrosion, cracking, and wiring deterioration are things that are usually understood, and can be expected to occur with the passage of time, but what about unknown problems? These are the unanticipated things, and not knowing what to expect and look for, or where to expect the unexpected, makes the maintenance job that much harder.

Some examples of not finding the hidden problems have led to such things as structural compromise, collapsing pilot seat frames, seized autopilot override systems, and the breakdown of bladder-type fuel tanks.

Take a Closer Look

"During maintenance, engineers need to be alert to potential tell-tale signs of ageing-related problems, and take a closer look to determine what may be causing the problem. Some examples can include working rivet heads, unusual or excessive component movement, stiffness of movement, or repeated failures in some areas. Other important areas to check, are those hidden areas not normally looked into.

"Corrosion, cracking, wiring deterioration, earlier repaired areas, structural issues, skin rippling, misalignments in the fuselage and with components like control surfaces and nacelles, may all be further tell-tale signs that a bigger problem is lurking beneath the surface," John advises.

A detailed examination of all the maintenance records will reveal a lot about the history of the aircraft, and help in heading-off potential problems. For example, knowing what sort of operating life the aircraft may have had, and what its operating environment (benign or harsh) was, will be useful information in checking for trouble spots.

Some Consequences

The consequences of age-related issues that are not identified or dealt with in a timely manner can be significant. These can include catastrophic failures with a consequent loss of life, increased repair costs, lengthy down time, and loss of revenue.

Some parts may no longer be readily available, if available at all, and can result in lengthy and costly delays in sourcing replacement parts.

Help

Manufacturers can provide relevant information about the design assumptions, and other information and advice.

Type certificate holders will provide design data assistance.

Maintenance providers will have up-to-date maintenance information, and can give advice based on their experience of the aircraft type.

Design engineers can help with modifications or repair schemes.

Non-destructive testing experts could help with developing inspection processes that avoid disassembly of some components.

Other owners, and clubs, can be sources of useful information.

Further Reading

"Ageing Aircraft Management Plan", CASA web site, www.casa.gov.au/ageingaircraft

"Revision to Cessna Service Manuals", March/April 2012 *Vector*. CAA web site, www.caa.govt.nz, "Publications". ■

Right: An example of significant corrosion damage found in an aircraft main wing spar structural component.

SMS is Coming

The draft Advisory Circular AC00-4 *Safety Management Systems* was released for public comment on 31 May. Submissions close on 31 July, and these will be evaluated with the aim of finalising the AC as soon as possible. Details of submissions received, along with the final version of the AC will be posted on the CAA web site soon.

It is unusual to be publishing an AC ahead of the related rules, but the aim was to get the 'nuts and bolts' information out there early, in order to give affected parties more time to plan their implementation of SMS, or ideally, to have it in place before the rules take effect. The Notice of Proposed Rulemaking (NPRM) is hoped to be released by the end of the year.

The NPRM will contain the proposed rules changes for Part 119 *Air Operator – Certification*; Part 139 *Aerodromes – Certification, Operation and Use*; Part 145 *Aircraft Maintenance Organisations – Certification*; and Part 172 *Air Traffic Services Organisation – Certification*. Other rules parts will follow, but note that the requirement already in Part 115 for an 'organisational management system' is effectively a requirement for an SMS.

Recent work has been in developing policy on risk-based regulation, a concept that Government is keen to adopt across all sectors, not just aviation. Once the rules do come into force, there will be a transition period to allow participants time in which to develop their SMS and have it accepted. The CAA encourages operators to get in ahead of the rules requirements, and will be working with industry to promote SMS and provide further guidance on implementation.

The most visible change in the rules will be the revoking of the 'Internal quality assurance' rule (eg, 119.79) in each affected Part, and replacing it with a rule requiring safety management systems instead. SMS incorporates many of the internal quality assurance requirements, and therefore for most organisations, the transition to SMS will be an enhancement of existing systems rather than a completely new set of requirements.

Accident / Incident Pyramid

The draft AC has been developed jointly by subject matter experts at CAA, and Aerosafe Risk Management, and comprises both acceptable means of compliance (AMC) content and guidance material. The introductory section discusses the relationship between SMS and other management systems such as quality, environmental, and health and safety, and makes the point that they can be integrated into a single SMS framework.

A safety management system is not just another document to be created to meet the rules requirements, then stowed on an office shelf – as the name suggests, it is a **system**, a living, breathing system that involves everyone at every level in the organisation. An SMS can be tailored to suit the size of an organisation, and to embrace aspects that may be unique to a particular operation. Proactively managing risk is a large component of SMS, and this is an opportunity for continuous improvement, not only in safety, but for the business as a whole.

The Flight Safety Foundation's President and CEO, William R Voss, addresses SMS in his May 2012 *AeroSafety World* editorial, and poses four questions, "that are really easy to answer if you have an effective SMS, and impossible to answer if you don't."

Ask yourself these questions:

- What is most likely to be the cause of your next accident or serious incident?
- How do you know that?
- What are you doing about it?
- Is it working?

Excellent food for thought, and it is worth reading the entire editorial, available on http://flightsafety.org/ ■

And **You Are...?**

You've just arrived at Bigtown Airport, on a private flight with some friends, and you're all heading into town on business. The aeroplane is conveniently parked at one end of the terminal apron, and airline staff have seen you walking to the terminal and opened an entry door for you. Through the terminal, and there is a taxi just dropping some passengers off at the kerbside – your timing is just right for a ride to town.

Meeting over, and you're now back at the airport. The last scheduled airline service has long since departed, and the terminal is now deserted. Further exploration confirms that there is no way for you to get back to the aeroplane, but away down the tarmac, there's a maintenance hangar with open front doors. That might be the way through.

At the hangar, there's a reception area, and the staff there are very security conscious. Even though you explain your problem, they still demand some verification that you are who you say you are. Fortunately, you've remembered to carry your PPL on you, and produce that. Can you then prove it's yours? Yes, you show them your driver licence with its photo ID. And the clincher – the aircraft keys, with the registration on the tag, which you wisely decided not to leave in the aircraft.

That scenario worked, but how to avoid difficulty in the future? For private operations, it is probably best to avoid parking at or near the terminal – better to park at the aero club or other GA organisation. Make yourself known to the staff on arrival, and let them know when you expect to be back and that you will require airside access. Pilots on commercial operations are able to obtain an airport identity card, as they could find themselves at an international airport (such as Queenstown or Rotorua) at short notice, and should be prepared.

GA commercial pilots would have more reason to park at or near airport terminals, for reasons such as dropping off passengers for a connecting flight. Access in these cases would seldom be a problem because of timings coinciding with the hours of attendance of airline or Avsec (where applicable) staff.

In the event that you are on a private operation into an international airport, and have to park in such an area, rule 19.357(g)(4) makes provision for pilots to have access to that area to enable servicing of the aircraft or the escorting of passengers to or from the aircraft, if the pilot carries their valid pilot licence. As suggested earlier, having a backup photo ID will help avoid potential difficulty in proving identity.

An important point on passenger care – if dropping passengers at or near a terminal area, shut down, help them unload their gear and escort them all the way into the terminal. Do not turn them loose on the tarmac to find their own way in. This places them at risk of physical harm as well as creating a potential security problem.

Lastly, the reference to leaving keys in aircraft is intentional – in numerous cases, airport security patrols have discovered light aircraft not only unlocked, but also with the keys still inside. It's bad enough having your fuel stolen, but the whole aircraft? That could take some explaining. ■

Helicopter Flight Time

In the article *For the Record* in the last issue, we discussed the difference between flight time and time in service, as defined in Civil Aviation Rules, Part 1. Note that there is no separate definition in Part 1 for helicopter flight time, and this has been the subject of recent dialogue with industry. See also the article *Inflated Hours* in the January/February 2004 issue of *Vector* (available on the CAA web site).

An aeroplane pilot can log as flight time the total, "from the moment an aircraft first moves for the purpose of flight until the moment it comes to rest at the end of the flight including all associated push back, taxiing and subsequent holding time." A helicopter pilot, under this same definition, is basically constrained to logging 'skids off' to 'skids on' time, even though the machine's lifting surfaces have been beating the air into submission at their normal operating speed for some time before liftoff and after touchdown.

ICAO Annex 1 *Personnel Licensing* defines Flight time – helicopters as, "The total time from the moment a helicopter's rotor blades start turning until the moment the helicopter finally comes to rest at the end of the flight, and the rotor blades are stopped." As this definition is not contained in Part 1, New Zealand has notified a difference to ICAO in this respect.

Helicopter pilots who feel disadvantaged by the difference, and who propose to work in another jurisdiction where the Annex 1 definition applies, can overcome this by recording the rotor start to rotor stop time separately in one of the spare logbook columns (16 or 17), and using that time as a basis for a licence application in that jurisdiction. ■

Flight Plan Format Changes

The changes signalled by the article in the November/December 2010 *Vector* and by Aeronautical Information Circular are now incorporated in the ICAO Flight Plan form. Although the changes affect only Items 10 *Equipment and Capabilities* and 18 *Other Information*, they are significant, and users need to familiarise themselves with them.

The changes became effective on 26 July 2012, but the old-format details can still be accepted up to 14 November. From 15 November onwards, only new-format details must be submitted. The transition period is a good opportunity to get up to speed on the new requirements.

Full details of the changes are listed in AIP Supplement 123/12, effective 26 July 2012. In Item 10, note that the standard COM/NAV equipment (signified by the letter S) no longer includes ADF, and the list of additional equipment has been greatly expanded. Under the heading *Surveillance Equipment and Capabilities*, the number of descriptors has also been expanded, to include more specific transponder categories, as well as provision for the various categories of ADS-B and ADS-C.

The lists under Item 18 have also expanded – note the changes under STS/ (reasons for special handling by ATS). In all, there are now 22 categories of 'other information', including a detailed table under PBN/, as opposed to the previous 18 options.

Amendments to *AIP New Zealand* Table ENR 1.10 – 1 *Instructions for Completion of an ICAO Flight Plan Form* will be effective on 15 November 2012. In the meantime, refer to AIP Supplement 123/12 or IFIS for details. For background information on the reasons for the changes, see the CAA web site, www.caa.govt.nz, "Aeronautical Services – Flight Plan Changes." ■

Funding Review Update

The CAA's Funding Review programme and recommendations, now in the final stages, are expected to be considered by Cabinet soon.

Once Cabinet has made its decision, details, including the schedule of decisions and any new regulations, as well as a frequently asked questions section, will be made available on the CAA web site, www.caa.govt.nz, "CAA Funding Review".

The CAA expects to be able to send out the annual reminder for payment of participation levy and registration fees to coincide with any new fee/levy structure implementation date. The amounts due will be adjusted pro-rata so that they reflect both the old fee structure period, and any revised fee structure period.

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).

Clarification

In the article "Swapping Rotor Blades" in the May/June 2012 *Vector*, we referred generically to the "parts catalogue" in several instances.

The article is intended to remind engineers to always check the appropriate documentation, and to never make assumptions or take anything for granted.

The specific example though, was a Eurocopter, and the agents have pointed out that the appropriate document is called a "Master Servicing Manual (MSM/PRE)" in that case.

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*
6 Aug 2012	13 Aug 2012	18 Oct 2012
3 Sep 2012	10 Sep 2012	15 Nov 2012
1 Oct 2012	8 Oct 2012	13 Dec 2012

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

Aviation Safety Advisers

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

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

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

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

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

Aviation Safety & Security Concerns

Available office hours (voicemail after hours).

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

For all aviation-related safety and security concerns

Accident Notification

24-hour 7-day toll-free telephone

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

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

Accident Briefs

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

ZK-OUI Cessna 172R

Date and Time:	28-Oct-08 at 9:00
Location:	Thames Aerodrome
POB:	1
Injuries:	0
Damage:	Substantial
Nature of flight:	Training Solo
Age:	19 yrs
Flying Hours (Total):	62
Flying Hours (on Type):	62
Last 90 Days:	16

The pilot commenced a go-around from an approach to Thames Aerodrome, but as he opened the throttle, he noticed a loss of engine power. He then closed the throttle and attempted to land in the remaining runway distance ahead. With insufficient stopping distance available, the aircraft ran off the end of the runway and came to rest in an oxidation pond. The pilot vacated the aircraft without injury.

Maintenance investigation found no defects other than one spark plug failing under load when tested.

CAA Occurrence Ref 08/4521

ZK-EQX Piper PA-38-112

Date and Time:	08-Nov-08 at 8:40
Location:	Hokitika
POB:	2
Injuries:	0
Damage:	Substantial
Nature of flight:	Private Other
Pilot Licence:	Airline Transport Pilot Licence (Aeroplane)
Age:	48 yrs
Flying Hours (Total):	21000
Flying Hours (on Type):	500
Last 90 Days:	200

During a dual landing in crosswind, the instructor allowed the student to drift off the runway and land on the adjacent grass, as the student had little training on crosswind techniques at that stage. The nosewheel dug into the soft ground and collapsed, damaging the propeller.

The Hokitika aerodrome chart contains the following note: "All aircraft operations be confined to the sealed runways and taxiways. Stay off grass. Surface very soft".

CAA Occurrence Ref 08/4705

ZK-HIW Robinson R22 Beta

Date and Time:	04-Nov-08 at 15:52
Location:	Nelson
POB:	2
Injuries (Minor):	1
Damage:	Substantial
Nature of flight:	Training Dual
Pilot Licence:	Commercial Pilot Licence (Helicopter)
Age:	37 yrs
Flying Hours (Total):	5242
Flying Hours (on Type):	192
Last 90 Days:	221

The helicopter was on a dual exercise, in which 360-degree autorotations were being taught. Surface wind conditions were 20 knots gusting 30. The first attempt was made from 1000 feet agl at an indicated airspeed of 40 knots, resulting in a near-constant ground position. During the turn, airspeed and rotor rpm decayed, requiring instructor intervention. The second attempted autorotation was entered at 60 knots, but airspeed and rpm were again lost in the turn. About 400 feet agl, the instructor took control and attempted a power recovery, but the helicopter landed heavily in mudflats short of the grass runway.

CAA Occurrence Ref 08/4650

ZK-LTC Pacific Aerospace Cresco 08-600

Date and Time:	14-Dec-08 at 13:00
Location:	Tarata
POB:	1
Injuries (Fatal):	1
Damage:	Destroyed
Nature of flight:	Agricultural
Pilot Licence:	Commercial Pilot Licence (Aeroplane)
Age:	48 yrs
Flying Hours (Total):	12100
Flying Hours (on Type):	Not stated
Last 90 Days:	110

The aircraft was engaged in topdressing operations from a farm property near Tarata, approximately 14 nm south-east of New Plymouth aerodrome. The aircraft loader driver became concerned when the aircraft had not returned to the airstrip after the usual flight duration of approximately three minutes. The loader driver tried to call the pilot on the radio but received no response. He then went in search of the aircraft and, after climbing a small hill, saw that the aircraft had crashed approximately 600 metres from the departure end of the airstrip. A farm worker who was first on the scene found that the pilot had not survived the accident. A full report is available on the CAA web site.

CAA Occurrence Ref 08/5163

ZK-CAT Grumman G-164A

Date and Time:	16-Nov-08 at 14:15
Location:	Acheron River
POB:	1
Injuries:	0
Damage:	Minor
Nature of flight:	Ferry / Positioning
Pilot Licence:	Private Pilot Licence (Aeroplane)
Age:	54 yrs
Flying Hours (Total):	818
Flying Hours (on Type):	83
Last 90 Days:	7

During a planned stop, the pilot cleaned the forward cockpit screen with materials from the rear luggage locker. Due to gusty conditions on the ground, the pilot temporarily secured the luggage door with only one of the five twistlock fasteners. Returning to the cockpit, the pilot stowed the cleaning materials with his pilot bag, forgetting about the partially-secured door. During flight and after encountering moderate turbulence the door came open in flight. This allowed a heavy cockpit cover to be sucked out of the locker and catch on the vertical stabiliser. A huge increase in drag resulted, but control of the aircraft was maintained.

The pilot completed a precautionary landing onto the side of a river bank. The aircraft sustained minor damage to the underside of the right wing.

CAA Occurrence Ref 08/4807

ZK-DGZ Airborne XTS-912

Date and Time:	09-Feb-09 at 14:00
Location:	Abel Tasman National Park
POB:	2
Injuries (Fatal):	2
Damage:	Destroyed
Nature of flight:	Transport Passenger A to A
Pilot Licence:	Commercial Pilot Licence (Aeroplane)
Age:	44 yrs
Flying Hours (Total):	855
Flying Hours (on Type):	460
Last 90 Days:	195

The microlight aeroplane departed Motueka for a local scenic flight and did not return. The wreckage was later found in the Abel Tasman National Park 2.3 km north-west of Totoranui. The CAA investigation found it was most likely that the pilot flew into a localised region of moderate to severe turbulence and associated rotor that initiated an in-flight breakup of the machine. A full report is available on the CAA web site.

CAA Occurrence Ref 09/323

ZK-DOD Cessna 180J

Date and Time:	29-Nov-08 at 12:00
Location:	Ruahine Corner
POB:	3
Injuries:	0
Damage:	Destroyed
Nature of flight:	Private Other
Pilot Licence:	Private Pilot Licence (Aeroplane)
Age:	38 yrs
Flying Hours (Total):	1477
Flying Hours (on Type):	1199
Last 90 Days:	18

The fracture surface of the failed leg. The fatigue portion of the crack is the rust-coloured area.

The aircraft had just touched down on the back-country airstrip when the left main undercarriage leg failed. The aircraft overturned and was destroyed. The three occupants escaped injury.

The leg was found to have failed at its lower end, across the line of the top two wheel attachment bolts. A fatigue crack had been propagating for some time, until eventually the remaining sound cross-section was unable to bear its intended loads. The aeroplane was fitted with 'tundra' tyres, which are larger and heavier than standard tyres, but no conclusive relationship between these and the failure was established.

CAA Occurrence Ref 08/5018

ZK-BXS Fletcher FU24-950M

Date and Time:	11-Nov-08 at 10:45
Location:	Hukerenui
POB:	1
Injuries:	0
Damage:	Substantial
Nature of flight:	Agricultural
Pilot Licence:	Commercial Pilot Licence (Aeroplane)
Age:	25 yrs
Flying Hours (Total):	1120
Flying Hours (on Type)	787
Last 90 Days:	103

The pilot did not accurately assess the change in wind velocity and, on the 32nd approach of the day, landed too far up the sloping strip to stop in the remaining distance available. The aircraft departed the upper end of the strip, slid down a high bank and came to rest inverted. The pilot was not injured and freed himself from the aircraft which was extensively damaged in the accident.

CAA Occurrence Ref 08/4739

GA Defects

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

Key to abbreviations:

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

Cessna TU206A

Roll pin

Part Number:	NAS561P3-6
ATA Chapter:	2820
TTIS hours:	11,000

Climbing through 9000 feet for a parachute drop, the pilot selected the left fuel tank, which contained approximately 120 litres.

During the descent the engine failed, and standard engine failure drills were carried out. Tank selection and quantity checked (right tank indicated 0), boost pump applied. Engine did not restart; shutdown drills were completed during the glide approach, and the aircraft landed safely.

Maintenance investigation found that the roll pin securing the fuel selector shaft to the fuel selector had become dislodged, preventing the pilot from changing the fuel tank selection. Once the fuel in the right tank was consumed, the pilot was faced with a total engine power loss. The roll pin was replaced and lockwired for added security.

CAA Occurrence Ref 11/4956

Cessna 421B

Combustion Heater

Part Model:	8472C
Part Manufacturer:	Stewart Warner
Part Number:	9910088-15
ATA Chapter:	2140
TTIS hours:	580

During scheduled maintenance, discolouration was seen on the external surface of the combustion heater. Although there is no requirement to pressure check the heater system before mandatory overhaul at 1000 hours TTIS, a pressure check was carried out. This found that the combustion chamber would not retain pressure, leading to the identification of a crack in the combustion chamber outlet pipe. Correspondence with a licensed South Wind repair company stated that cracks in the combustion chamber of heaters with 400 to 600 hours were fairly common. The constant thermal expansion and contraction of the metal causes fatigue cracking. The defective heater was replaced with a serviceable unit.

CAA Occurrence Ref 11/4429

Cessna 404

Magneto Rotor

Part Model:	S6LN-1201
Part Manufacturer:	TCM
Part Number:	10-349220-4
ATA Chapter:	7410
TSI cycles:	2
TSI hours:	2.5
TTIS hours:	438

After the left engine failed to start, maintenance investigation found that the left-hand magneto had failed. The magneto had recently been installed following a 4-year/500-hour inspection.

It was considered that the most likely cause for the failure was that the plastic distributor gear had failed, losing teeth, which then lodged between the rotor and main housing, causing the rotor alloy housing to loosen on the driven shaft. The shaft rotating inside the alloy magnet housing generated sufficient heat to blue the distributor gear and rotor shaft. The heat has further stressed the plastic distributor gear, causing all teeth to be stripped off. The magneto was repaired under warranty.

CAA Occurrence Ref 11/4178

Beech V35B

Cylinder base nut

Part Model:	IO-520B
Part Manufacturer:	Superior Air parts
Part Number:	652541
ATA Chapter:	8530
TSI hours:	1220
TSO hours:	1220
TTIS hours:	1220

The pilot heard a 'ping' noise after shutdown from a flight. On investigation, he found that the 12-point cylinder hold-down nut on the number 6 cylinder upper left hand through-bolt had split vertically down the thread bore, and had opened up approximately 2 mm.

The nut was sent for metallurgical investigation by the CAA. The investigation found that the nut had split due to hydrogen embrittlement caused by corrosion (rust) on the nut. This was one of only two similar occurrences that have been reported to the CAA. The metallurgical report has been passed on to the supplier for their information.

The CAA suggests that if the 12-point cylinder hold- down nuts on Continental engines are found to be corroded, they be replaced by new items to prevent similar failure.

CAA Occurrence Ref 11/172

Bell 206B

Power turbine governor

Part Manufacturer:	Honeywell
Part Number:	2549170-1
ATA Chapter:	7320
TSO hours:	1037.4

The pilot felt a 'hiccup' during a spray run and decided to carry out a precautionary landing. On landing, the RPM was controllable only by use of the throttle. The power turbine governor drive shaft was found to be sheared off, and the governor rotor seized. Further investigation revealed that the spool bearing had failed. The power turbine governor was subject to a bearing upgrade in accordance with CEB 1402, which had not been carried out.

CAA Occurrence Ref 11/4031

Hughes 369D

Shim

Part Model:	369 series
Part Manufacturer:	MD Heli
Part Number:	369A4580
TTIS hours:	6383

During a training flight, the engine shut down. The pilot carried out an autotation to the ground and made a safe landing. It was discovered that the collective throttle linkage gearset had disengaged due to incorrect shimming used in the gear assembly in the pilot's collective.

CAA Occurrence Ref 11/3110

Cessna TU206A

Turbocharger

TTIS hours:	470

During climb, the pilot noticed a strong smell of fumes, the engine rpm dropped to 1300, and all power was lost. The pilot declared an emergency. Some power was recovered, and the pilot was able to glide the aeroplane to a landing.

Engineering inspection revealed that the turbocharger had failed. The operator decided to keep a spare turbocharger and replace it every 400 hours. This turbocharger had completed 470 hours, and was due to be inspected at 500 hours.

CAA Occurrence Ref 11/4174

Cessna 208B

Autopilot

ATA Chapter:	3418

The operator reported that during an approach the autopilot failed to capture the glideslope. As a consequence the aircraft ended up below the approach profile. Engineering investigation determined that both antennas were unserviceable.

CAA Occurrence Ref 11/1210

Aerospatiale AS 355 F1

Blades

Part Manufacturer:	Eurocopter
Part Number:	355A-0020-13
ATA Chapter:	6210

In replacing the main rotor blades on the helicopter, the engineers installed unapproved parts intended for military aircraft. It transpired that the procurement process did not detect that the parts were unapproved and that an Airworthiness Approval Tag 8130-3 had been issued by the DAR in the United States. The certifying engineer omitted to make an extra check on the part number eligibility. A number of preventative actions have been taken by the maintenance organisation to prevent a reoccurrence and the FAA have been informed. See article, "The Right Bits", in the September/October 2011 issue of *Vector*.

CAA Occurrence Ref 10/4946

Alpha R2160

Pilot seat shell

Part Number:	KP4FS464/MS27640-4
ATA Chapter:	2510

During a pre-flight inspection, the pilot discovered that the pilot's seat shell was cracked. A design feedback form was sent to the manufacturer and a response was received. The manufacturer considered that the design and manufacture of the seat was satisfactory. The damage appeared to be the result of pilots entering and exiting the aircraft in a way that strained the seat back.

CAA Occurrence Ref 11/1223

Pacific Aerospace Cresco 08-600

Aileron quadrant pivot bearing

Part Model:	KP4
Part Manufacturer:	ITB
Part Number:	KP4FS464/MS27640-4
ATA Chapter:	2711
TTIS hours:	73

During a pre-flight inspection by the pilot, binding was noticed in the operation of the ailerons. Maintenance investigation found that the left-hand aileron quadrant pivot bearings were seized. The bearings were replaced with new items.

CAA Occurrence Ref 11/4391

NZ Aerospace FU24-954

Brake hose

Part Number:	111417-4-0360
ATA Chapter:	3242

The right brake pedal went to the floor when the pilot applied the brakes to park on the airstrip. Maintenance investigation found that the right-hand flexible brake hose had worn through where it is located with a P-clip on the undercarriage leg scissor link. The flexible brake hose was replaced.

CAA Occurrence Ref 11/3677

Free
Aviation Safety Coordinator Course

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

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

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

- you will get a comprehensive safety manual;
- access to all of the latest CAA safety resources and support; and
- lunch is provided (accommodation, transport and other meals are not provided).

Christchurch

Thursday 6 – Friday 7 September 2012

Copthorne Hotel Commodore
449 Memorial Avenue
Christchurch

(Airport courtesy shuttle available)

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

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