

vector



Startle!

Go-Arounds
 A Heads-Up on
 Night VFR

So You Don't Think
 You Need a NOTAM?



In this issue...



Startle!

When cockpit technology has made so many things predictable, how is new research teaching airline pilots to cope with the unpredictable? There's also a role for GA flight instructors.



Go-Arounds

More than half of all aviation accidents could have potentially been prevented by the decision to go around. Are you prepared to make the call?



A Heads-Up on Night VFR

The first piece of advice is 'don't do it'. But if it is absolutely unavoidable, here are some great pieces of advice from the specialists.



So You Don't Think You Need a NOTAM?

"Definitely a matter of when, and not if, there's a mid-air collision". The perils of non-compliance with a NOTAM or AIP Supplement.

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Startle!

A fire warning, sudden stall, an engine failure on takeoff, a cockpit alert: some pilots react quickly and appropriately, some act after a long delay, a few freeze. Exploring the best way to train pilots to cope with 'startle and surprise' is gathering momentum around the world.

The words 'Air France 447' are today synonymous with an inadequate response to an abnormal situation by a largely technologically trained crew.

The crash into the Atlantic Ocean in June 2009 of the Airbus A330 was found to be largely the result of the crew's inability to understand, nor cope appropriately with, temporary inconsistencies between airspeed indications causing the autopilot to disconnect. Those inconsistencies were later thought to be the result of ice crystals blocking the aircraft's pitot tubes.

It was found that the crew's actions ultimately caused the aircraft to enter an aerodynamic stall from which it did not recover.

The words 'AirAsia 8501' have the same resonance. The investigation of its crash into the Java Sea in December

2014 found that while a faulty part contributed, the crew's subsequent action led to a total loss of control.

The investigator's report said that when the crew was required to manually fly the Airbus A320, there was an unexplained and crucial nine-second delay before a pilot attempted to take control. By that stage the aircraft was banking at 54 degrees.

The report from Indonesia's National Transport Safety Committee stated, "Subsequent flight crew action resulted in inability to control the aircraft... causing the aircraft to depart from the normal flight envelope and enter a prolonged stall condition that was beyond the capability of the flight crew to recover."¹

1 Jacdec, NTSC/KNKT Final Accident Report PK-AXC.

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Australian researchers at the University of Southern Queensland (USQ), led by Dr Wayne Martin from USQ's Department of Aviation and Logistics, are looking at how 'startle' impairs pilots' decision making during unexpected critical events. Numerous studies so far indicate it can be as long as 30 seconds before they're thinking clearly.

Wayne Martin says that in a 2015 simulator study of the effects of startle on 18 pilots flying IFR, only five did a good job in responding. Seven were badly affected by the startle stimulus and displayed behaviours significantly delayed or dangerously unstable.

"Three of those pilots continued descent so low that they became visual, with two receiving EGPWS warnings 'Pull Up, Pull Up'.

"Two continued with their unstable approaches and landed, while one went around from a very low altitude."

The researchers say one of the common themes emerging from the ever-increasing reliability of aircraft, is that some startled pilots either take no action, or take inappropriate action, resulting in an 'undesired aircraft state' or even an accident. If a real threat is signalled by the startle, the response can be even worse.

"There's a conditioned expectation of normalcy among today's pilots," says Dr Martin. "If aircraft perform nominally day after

day, year after year, and pilots are rarely exposed to actual malfunctions, then it's not hard to see how this conditioned expectation of boring sameness and normality can develop."

The French civil aviation investigating body, BEA, found the crews of Flights 447 and 8501 acted in a similar manner, in that they failed to respond appropriately to startle indications.

The BEA's investigating officer, Nathalie de Ziegler, said there was a need for "increased academic and operational understanding of aircraft flight regimes, improved stall recognition, being able to revert to basic and raw-data flying without delay, and importantly, to understand stalls as a 'startling incapacity'."²

Dr Martin says the problem is that the level of expectation for novel or critical events is so low that the level of surprise or startle which pilots encounter during such events, is higher than they would perhaps have had some decades ago, when things routinely went wrong.

He says research into the startle response is gathering speed, globally.

"There are still many unanswered questions about the best type of training to 'futureproof' pilots against the effects of startle and surprise.

2 CAT Magazine, 4.2016, p8.



"I have two studies coming up: one where at least half the pilots will receive some training prior to their sim exercise, including a comprehensive briefing on real world examples where startle and surprise have had disastrous outcomes. That briefing is accompanied by discussions on scenario-based 'what would you do if...' situations.

"The second will involve the pilots being exposed to a startling situation, followed by discussion and briefing, with further repetitions to get to a standard of competency. Those pilots would also be given the same briefing package as the first group, after the exercise, to take away for post-exercise reading."

Wayne Martin says that the studies are trying to establish what form of training is the more effective in preparing pilots for unexpected events.

"At this stage, however, there's no way to know how long that training would remain effective, given that the pilots concerned will leave the sim to work in virtually trouble-free environments."

A Change in Thinking

CAA's Principal Aviation Examiner, Bill MacGregor, says after the crash of Air France 447, there was a global rethink on training.

"When the Airbus A320 was first introduced, it was this magic electronic jet that did everything, and all you had to do was sit there.

"So pilots were introduced first to the technology of the aircraft, and then they worked backwards, learning how to cope when this electronic bit was taken away, when that electronic piece was removed, when mock emergencies were introduced."

But Bill says after the Flight 447 tragedy, Airbus and Boeing radically changed their thinking about recommended training.

"Instead of introducing the pilot to the technology first, the pilot is introduced to the basics of flying the plane, then slowly to the technology.

"That change in training is being made on the basis that when things go awry, we revert to what we learned first, even if that first learning was 20, 30, years earlier.

What Does This Mean for General Aviation?

Bill says modern GA aircraft and microlights are coming up with "some fantastic stuff", but that means student pilots are not being trained to the depth that they used to be.

"Even though it's getting safer and safer to fly, the majority of aeroplanes are still the 40 to 45 year old Cessna 152, 172-type

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aircraft. They're still piston engine technology and they still fail, and you still have to hand fly them.

"Things like advance stalling, or flying the aeroplane to the edge of its envelope. We fly in the middle of the performance envelope, instead of pushing out towards the edges, to see what the aeroplane is capable of – slow flight, high speed flight, rolling, turning, pitching.

"Because we've got better technology we're not pushing it so hard. I just have this sense that we are training to the technology rather than training to the flight envelope of the aeroplane."

Bill's advice to instructors? Declutter the glass cockpit.

"Just learn the basic instruments – fly it on attitude, fly it on trim, fly it on power.

"Then slowly introduce the capabilities of the technology. Because once all the bells and whistles are introduced, they are distractors. It's hard to tear your eyes away from the information in front of you on the screen, instead of looking outside.

"I feel like startle is a bit of a startling word. Basically it's about understanding that the technology is not always going to save you – and you need to be prepared to go back to basics."

For Instructors

One of CAA's Aviation Safety Advisers, Carlton Campbell, recipient of the CAA Flight Instructor Award in 2015, says training in startle must reflect reality.

"When I was an instructor in Queenstown, I had permission from several farmers to use their property to land on.

"Many training organisations don't have that luxury and they do their failures down to 500 ft and then go around. They would simulate the below-500 ft when they got back to the airfield which doesn't offer much realism in terms of an engine failure.

"That last 500 feet ends up being unfamiliar in a variety of scenarios when you have limited options for simulating it.

"So a student with me would typically put the power in to go around, and I'd say 'no, all the way to the ground thanks'. And you could see their mind ticking over 'I've never done this before!' They were ill-prepared for the real scenario of engine failure. That last 500 feet is the critical bit, whether you get it on the target paddock or not.

"So my recommendation is that we make the training as real as possible, within the resources that we have."

Carlton's second recommendation is that startle training is done over and over and over. He says, as an example, two-thirds of his training flights would have incorporated engine failure after takeoff.

"We had pilots from all over the world with varying levels of training and experience under their belt. But frequently, I could tell from their surprised reaction and delayed response to simulated abnormal situations, that continued training beyond basic competency ('overtraining') had been missing from their flight instruction.

"The simulations I'd offer showed up the inadequacies of training that wasn't real, for instance, the expectation of the pilot was that we were going to go around at 500 ft."

Carlton's particular area of expertise is in mountain flying.

"When we would train students in mountain flying, we'd get them to turn using all the available space, and at medium angles of bank.

"But they'd come around the second 180 degrees part of the turn, and they'd find the terrain looming in their face, and they'd constantly be wanting to put on more bank, but more bank doesn't necessarily tighten the radius of the turn.

"They suddenly felt as if they were going to hit the hill and they were saying 'I don't know what to do!'

"I've flown with one or two pilots who've been so overwhelmed they've taken their hands off the controls."

"In fact, the technique is to apply back pressure to reduce the radius of the turn."

There is also a very small number of pilots, says Carlton, who have an almost fatalistic response when faced with something beyond anything they have experienced before.

"At Milford for example, on a hot summer's day you get significant sea breeze funnelling in and when you're on approach to land towards the sea, you get a lot of turbulence and wind shear.

"I've flown with one or two pilots who've been so overwhelmed they've taken their hands off the controls.

"But with overtraining for that situation, the startled reaction is eliminated."

Carlton says that before instructional technique courses were beefed up, the 'ranting' instructor could provide 'startle'.

"The students became stressed by the ranting, and could not respond effectively, in terms of flying skills. Very few people do, to verbal bullying.

"If we're going to lay our stress on to the student they are likely to fail, because they cannot think straight.

"Instructors – all of us – are guilty of doing this at times."

Carlton's advice to other instructors, in summary, would be to train in all forms of startle, using the principle of the student 'overlearning' a response, and make the training compare realistically to the experiences the pilot is likely to face.

"I'd be surprised if any pilot has not experienced a startle situation somewhere," he says. ■

Change of Ownership

Buying or selling an aircraft? It's important that you know how to change the aircraft's ownership details.

For many people, aircraft ownership is a lifelong dream, while for others it may be an investment or a business decision.

Regardless of why you're buying or selling an aircraft, there are obligations under rule 47.57 *Change of possession of aircraft* that must be met. For further guidance, see Advisory Circular AC47-1.

The form used to lodge a change of ownership – 24047/03 *Notice of Change of Possession of Aircraft* – can be found on the reverse of the aircraft's Certificate of Registration, or can be downloaded from the CAA web site, www.caa.govt.nz.

Note that the Civil Aviation Act 1990 defines 'owner' of an aircraft as the person lawfully entitled to possession of the aircraft for 28 days or longer – this may differ from the financial or legal owner(s) of the aircraft.

Buyer Considerations

When buying an aircraft, the change of possession form needs to be filled out by yourself and the seller. If you're going to physically meet the existing owner to exchange payment, you should complete the form with them at that stage.

The fee for changing possession is the responsibility of the vendor, but you may come to your own arrangements. You would be wise to ensure the seller is aware of their obligation to pay the fee.

If you lose contact with the seller and need to register the change, a 24047-03A *Notice of Change of Possession of Aircraft (Relinquishing party unavailable)* form can be completed, but must be accompanied by the change of possession fee.

You have 14 days from the sale date to submit the application and fee, to ensure time for a new Certificate of Registration to be issued. It is an offence to operate an aircraft without a valid Certificate of Registration.

If you're planning to import an aircraft, be aware that you also have obligations to meet to register it in New Zealand.

Seller Considerations

When selling an aircraft, the most reliable way to handle the change of ownership process is to have the buyer complete their part of the paperwork before you hand the aircraft to them. Once the form is complete, send it to the address provided and be sure to include the change of possession fee – that is your responsibility as the relinquishing party.

The new buyer can complete and submit their part of the form separately if necessary, but it is important that you lodge yours, as you would otherwise continue to be responsible for the aircraft, and any fees it incurs.

Why This Matters

The change of possession process is more than just red tape; it has direct safety implications. The registered owner of the aircraft is sent Emergency Airworthiness Directives that could ultimately save their life. The owner will also be easier to contact or identify in an emergency.

When changing ownership, ELT beacon details should also be changed at www.beacons.org.nz, as an aircraft cannot be flown without its beacon being correctly registered (rule 91.529 *Emergency locator transmitter*).

Another thing to be aware of is that the annual registration fee and participation levies are invoiced to the registered owner of the aircraft on 1 July. Buyers should ensure the most recent levy has been paid, and sellers should be aware of their obligation to pay if change of ownership isn't processed by 30 June.

Under changes proposed to take effect from 1 July 2017, it will be possible to defer the participation levy for aircraft that cannot be operated for more than three months, for example due to maintenance or restoration. To apply for the deferral, owners will need to notify the CAA before the new levy cycle starts on 1 July 2017. ■

Hands Off the Accident Scene

It's a world of selfies and rushing to be first to break the news on social media. That's led to the work of CAA and TAIC investigators being frustrated by people deliberately or inadvertently interfering with aircraft accident scenes.

Interfering with the scene of an accident (as defined by the Civil Aviation Act 1990) is not only dangerous, but against the law. It's important any physical evidence, such as ground scars, are left undisturbed, for obvious reasons.

There are exceptions to that, such as having to remove survivors – both human and livestock – from wreckage, and protecting the wreckage and any cargo.

Wreckage near the sea can be moved when it's below the high tide mark or in places where it can be damaged by water. Wreckage can also be moved if it prevents public access through, or aircraft from using, an area when there's no practical alternative available. Examples are a railway line, major road or an airstrip. If it proves necessary to move the wreckage, photographs of the accident scene should be taken beforehand.

In those cases, the wreckage should be *“moved only so far as necessary to ensure its safety; and... be kept in separate distinct areas to indicate from which part in the aircraft it has been taken”*.

– Part 12 *Accidents, Incidents, and Statistics*

It is rare that wreckage would need to be disturbed after survivors are removed.

Investigations

Emergency services are typically the first to respond to an accident. Safety investigators may not arrive until the next day, or even later, if deployed at all.

Once the emergency services' work is complete, the aircraft involved comes under the jurisdiction of the investigating authority, as outlined by Part 12 of the Civil Aviation Rules, and Part 12A of the Transport Accident Investigation Commission Act 1990.

That means the aircraft owner or operator does not have the right to access the accident site without prior authorization of the investigator in charge.

Even when a safety investigator is not sent to an accident site, owners or operators need to gain clearance from the CAA before the wreckage is moved.

Why So Strict?

There are three main reasons for the above rulings.

Firstly, accident sites are inherently dangerous. Many aircraft are now being built from carbon fibre or similar products, and can create a significant hazard if there's a post-impact fire.



Burned carbon fibre can produce airborne synthetic particles, similar to asbestos, and the smoke created by any carbon fibre-based fire is believed to be dangerous if inhaled.

Safety investigators always perform a full risk assessment before deploying to an accident scene, and again when arriving, to protect themselves against any possible hazards at the crash site. That allows them to decide on the need for any personal protective equipment needed to carry out their investigation.

“There’s no point putting yourself in a position that you’re going to need to be rescued from,” says CAA Safety Investigator, Matt Harris. “Accident sites are also known to contain pathogenic substances, which can cause disease. Potentially explosive devices such as oxygen bottles, high-pressure tyres and ballistic parachutes could also be present.”

Ballistic parachutes, which are found on some microlight and certified aircraft, are particularly dangerous. They can be deployed by pilots in an emergency via a rocket that accelerates to more than 200 kph in the first tenth of a second after ignition, and they can be a serious threat to emergency personnel.

“A badly damaged aircraft may have already placed the activating cables of the ballistic parachute into a stretched state which can make an accidental detonation more likely,” says CAA Safety Investigator, Dan Foley.

“Those cables need to be dealt with by trained personnel who carry specialist equipment to make the ballistic parachute safe.”

Secondly, it’s important to protect the sanctity of the accident site. Safety investigators learn about accidents from both the wreckage and the ‘witness marks’ or scars on the ground.

“Scars like propeller strike marks, burned areas, or areas damaged by fuel obviously help the safety investigators determine what happened,” says Matt Harris.

“That job is made more difficult if those marks are damaged by vehicles having been driven across the accident site, or by the footprints of casual observers.

“Likewise, changing the position of the wreckage mars the safety investigators’ ability to determine the sequence of events during the accident.”

The third reason for restricting access to the site is to assist the co-ordination of any necessary rescue.

All accidents should be reported to the CAA on 0508 ACCIDENT (0508 222 433). Those calls are answered by the Rescue Co-ordination Centre (RCC) which organises any rescue.

They are seeing potentially hazardous situations develop when local companies try to arrange their own ‘save’.

In the last 12 months several helicopter companies have responded to a Proprietary Tracking System (PTS) signal from their own aircraft and have attempted a company rescue at the same time the RCC has responded to the Emergency Location Transmitter signal. That has meant increased air traffic at the accident site, as the RCC helicopters and the company aircraft occupy the same airspace, increasing the hazard level for everyone.

Private companies must, on receiving a PTS signal, immediately contact the CAA (phone 0508 ACCIDENT or 0508 222 433) and then liaise with the regulator as to how best to respond.

So, in short, unless there are people or animals in dire need of help, leave accident sites alone – for your own safety, and for the validity of the accident investigation to come.

Further Reading

Email info@caa.govt.nz to get a free copy of the booklets *How to Deal with an Aircraft Accident Scene* and *How to Report Occurrences*. ■





Go-Arounds

The decision to go around is a standard procedure, but could have a greater impact on aviation accident rates than any other.

A Flight Safety Foundation (FSF) study found that 54 per cent of all aviation accidents could have potentially been prevented by going around.

Any time a pilot identifies that their landing or approach is compromised, they must see going around as a viable and safe alternative. If there is any doubt, there is no doubt – go around!

CAA Aviation Examiner, John Parker, is unequivocal.

“Go-arounds are not an emergency procedure. A pilot should be praised for making the decision to go around.”

A Stable Approach

A pilot could decide to go around for any number of reasons, whether due to low visibility, runway incursion, aircraft positioning, or windshear.

Often, the decision is made due to an unestablished approach, so what factors should a pilot consider when assessing whether their approach is stable?

The FSF Approach and Landing Accident Reduction Tool Kit includes the following elements of a stabilised approach:

- » The aircraft is on the correct flight path, requiring only small heading or pitch changes to maintain it;
- » Speed is not less than V_{REF} (note: V_{REF} is the calculated minimum speed at the 50-foot point for a normal landing);

- » The aircraft is correctly configured for landing;
- » Power setting is appropriate for configuration;
- » All briefings and checklists have been completed.

The criteria may differ slightly between operators, but the basic principles are the same.

Decision Time

A decision to go around should always be taken as early as possible, before a critical situation develops. Again, if there is any doubt – go around.

Rocky Rua, Flight Safety Officer at CTC Aviation, believes training, and Standard Operating Procedures can make the decision simple.

“A pilot must maintain a high level of situational awareness, and must initiate a go-around if they identify any variables sitting outside the parameters of a stable approach. We ensure that happens with our SOPs,” he says.

“We teach our standard approach patterns with two gates on the final approach track which ensure the aircraft is positioned correctly. If the two gate criteria are not met, then a go-around must be initiated.”

In the interest of safety, go-arounds can be initiated at any stage of the landing. As a rule of thumb however, the *minimum* go-around height on approach should be no lower than the



highest obstacle or terrain at the top of the strip, or along the projected climb-out path.

Knowing the Risks

While it is important to see the go-around as a normal part of flight, it is just as important to be aware of the risks involved with the manoeuvre.

Loss of spacing is a possibility following, or during, a go-around, so a pilot must always maintain situational awareness. Position as required to maintain visual contact.

Another possibility is loss of control, so it is important to remain calm and focused throughout. Being well practised and following procedure are key.

"When flying, aviation should mostly be boring and procedural. If it's getting exciting, you're doing it wrong," says John Parker.

Be wary of relying entirely on nose attitude during a go-around procedure, making sure to monitor the airspeed indicator so speed doesn't degrade dangerously. This is doubly important in hill country where false horizons can affect judgement.

Performing the Go-Around

If the go-around was initiated due to traffic on the runway, or you're unsure of traffic considerations on the ground, it is advisable to perform the procedure to the right of centreline. This ensures that any aircraft on the runway, or climbing out, remain in sight to the pilot's left.

The best way to approach a go-around is to power up, clean up, and climb.

Always use the maximum permissible power during a go-around. There is no point keeping a reserve of power, particularly in a tight situation. It pays to remember that the extra power may result in a strong upwards pitch, particularly in an aircraft trimmed for descent with flaps extended.

Clean-up is important, as full flap go-arounds can result in disaster. Most light aircraft achieve their best angle of climb with zero or takeoff flap set. Ensure the aircraft has sufficient speed before reducing flaps so as to avoid a stall condition.

As the aeroplane accelerates, the nose should be on the horizon. At a safe height and airspeed, with a positive rate of climb, the remaining flap is raised gradually. Once at climb speed, it can then climb to circuit height.

"It's better to accelerate over the aerodrome than over the obstacles at the end," says John.

The aeroplane should be flown upwind along the climb-out path to the normal crosswind turn point. Turning crosswind early will shorten the downwind leg and may rush preparation for the approach. Any decision to turn early must consider other traffic in the circuit and must have ATC approval, if in controlled airspace.

With the aeroplane established in the normal climb, and trimmed, it may be necessary to advise ATC or other traffic that you are "going around".

Rocky Rua reminds us of the old adage *Aviate – Navigate – Communicate*.

"We put a big emphasis on the 'Aviate'. People want to jump on the radio and communicate, but they should take the time to fly the aircraft first," he says. ■

Don't Let Your Software Trip You Up

When your home computer throws a wobbly, the worst that might happen is you lose your recipes, but if you're an aviation operator the results could be disastrous.

There are all sorts of fish hooks you should be aware of if you're relying on documents and spreadsheets to help run your aviation operation.

Darryl Hodgson, an IT professional from Christchurch, has come across a few of them.

"You get a little flashing icon saying, 'do you want to upgrade now?' And you say 'yes'. Everyone wants the latest and greatest but there are consequences to that.

"So you upgrade to the latest version, but you find some things aren't compatible. You had a spreadsheet macro that you wrote 10 years ago and now it doesn't work.

"Or you might use a traffic light configuration where a spreadsheet cell will go from green to red to alert you when, for instance, a part needs replacing, or crew are due for training.

"If that system fails, how are you going to know when a part needs replacing?"

Darryl says people need to be aware that when they upgrade to the latest software, or transfer data from one version to another, formulas and macros can break.

How do you know if it's working or not?

"You wouldn't have to test every cell in a spreadsheet, you could test just a couple. But who's going to remember to do that? Who is going to take that responsibility?"

Darryl says such issues can be mitigated.

"If it is a mission-critical situation, you've got to put some controls in place. Making sure everyone in your team is running the same version of the software is a good place to start.

"Using a document management system will also save you a lot of headaches. It means you have to check in and check out your documents. Changes get recorded, and can be tracked if there's a problem.

"The large airlines will have IT infrastructure in place so the versions of software and patches they run will be airtight, but it can be a challenge for smaller operators."

Darryl says operators could consider getting in an IT expert for quarterly health checks.

"You wouldn't sort out your books without an accountant, or sell a house without a solicitor, so why try to fix a computer problem on your own?"

Another common scenario is where people will be working from home on their laptop and they'll be working on a version of software different to the one at the office.

"Everything looks fine but when they open it up at work, it's different. Inevitably they end up copying and pasting. Or you might have two spreadsheets, one on your server and one on your desktop and you end up copying from here and pasting there. The formatting and formulas you set up at the start can become corrupted along the way."

Transferring data from one version of software to another can be fraught with problems, so aim to do everything in the *one* document, on the same software platform and version.

Darryl says even if you are working on different software applications try to save documents in a common format.

"If you do have two different versions of software, you can lock down the *save as* functionality so that your *save as* function is always the same version." ■

A Heads-Up on Night VFR

With the days closing in, some pilots begin to test their luck, pushing on later and later into the darkening sky. And in some cases, that's further and further toward disaster.

"It's a truly horrible feeling."

That's the opinion of 10,000-plus hours fixed wing and rotary pilot, Grant Twaddle, describing an inadvertent entry into IMC (Instrument Meteorological Conditions) in a suddenly darkened sky.

"You push your luck," says Grant, also CAA's team leader of helicopter operations, "until you end up looking out the windscreen and all you can see is your own reflection."

The risks associated with VFR flying are heightened at night, for obvious reasons. Visual references are limited – some disappear altogether – central vision is not as efficient as during daylight, there's often nothing to focus on, but at the same time, there can be a number of visual illusions to confuse the pilot.

Grant recounts a personal experience of such an illusion.

"Some years ago I was flying at night to an oil rig off New Plymouth. It was so dark that all I could see was a pinprick of light and I couldn't tell whether it was large but far away, or small and quite close. But with absolutely nothing else to orientate me, that is what I kept looking at.

"Then the pinprick of light, which I decided was coming from the oil rig, suddenly jumped some way to the left. It was really unsettling."

The illusion is called autokinesis and arises, it is thought, from tiny, natural movements of the eye. It doesn't happen in the light because there are visual clues to correct what the brain thinks the eye is seeing.

Fortunately, Grant was able to fly IFR for the rest of the journey. The message to VFR pilots is to resist fixating on such a light, looking at it briefly only to assess if it is stationary or moving, such as another aircraft.

Spatial disorientation is another illusory risk. It can develop when there's nothing to give a pilot environmental clues as to where their body is in space, and they lose a sense of 'up' and 'down'.

An example is the 'coriolis illusion' where the pilot moves their head excessively, especially during turns, causing the balance mechanism in their ears to become confused, producing a tumbling sensation.

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These, and other dangers peculiar to night flying, lead the CAA's Principal Aviation Examiner, Bill MacGregor, to advise simply, "Fly VFR at night only if you have to."

But, he says, pilots who have no choice but to fly in the dark should be aware that their eyes will take at least 30 minutes to fully adjust to low light.

"It's called 'dark adaption', so remember to plan for that period when vision is becoming accustomed to the lack of light.

"Be aware of how sudden light and darkness can affect you, and avoid bright light after you've adapted to the dark."

Bill says the VFR pilot flying in the dark should also be on their guard for a phenomenon called 'empty field myopia'.

"That's where the lens of the eye focusses on a point just in front of the pilot, because there's nothing real for the eye to target. Pilots in such a position need to make a conscious effort to look at something further away, such as a wing tip, to readjust their focus."

If a pilot becomes disoriented by sensory illusions, Grant Twaddle advises them to refer to the aircraft's instruments, even if external lighting is quite good.

"Scan the relevant instruments, before making any control inputs."

That includes checking that the dimmer controls are set to suit the operation of that particular aircraft.

"At least two commercial helicopter accidents in the last few years," says Paul Breuilly, team leader of the CAA's safety investigators, "have identified that the crews had not adjusted the dimmer controls.

"Crews who operate in different aircraft types and type variants need to make sure they are familiar with the cockpit layout. You can have the same helicopter type with different dimmer controls and in a different position, and some even dim the warning indicator lights.

"Pilots need to be aware of this."

Preparation is Key

When *Vector* called, Pete Turnbull, CEO of the Whangarei-based Northland Emergency Services Trust, said his organisation was just beginning its annual competency check in night flying.

"We're reviewing all aircraft systems pertaining to night ops. That includes the lighting."

Pete says night flying requires preparation to be carried out with even more care than usual.

"Currency is essential, but get that in a controlled environment before you head into the night.

"Standard tips for safe flying apply even more so at night.

"You should be familiar with the territory you're flying over, and the facilities available at the other end, such as pilot activated lighting, refuelling, and runway lighting.

"Also, make sure you are thoroughly updated en route about the weather, because at night, it's obviously more difficult to know what it's doing."

Chief Flying Instructor at Kapiti Aero Club, John Harwood, suggests a torch is kept on board, for use if the cockpit lights go out.

"Head lamps are even better because they free up hands, and look in the direction the head looks. They have a bright white light, but with two clicks, some also give a nice red night-vision light."

The red night-vision light is important, because if the pilot is suddenly exposed to a beam of bright light, even for a moment, their eyes can take some time to again readjust to the relative dark of the cockpit.

"The length of time that takes will depend on how bright the light is and how long it lasts. Sustained bright light may mean it takes a full 30 to 40 minutes to adapt again to the dark of the cockpit.

"While there's nothing much a pilot can do about an unheralded momentary blast of light, if the light is sustained

they can close one eye, so that one at least maintains dark adaptation.”

John Harwood also emphasises the need for a thorough preflight inspection.

“Make sure all instruments, including lights, are working correctly, and carry plenty of fuel – because if the landing lights are out where you want to land, you may be diverted.”

Human Factors

CAA helicopter operations inspector, Jason Frost-Evans, says fatigue is another risk related to night flying, one that often goes unrecognised.

“Stick to personal minimums – use the I’M SAFE checklist. Know your limitations including what times of the day you’re at your best and worst, and get advice from more experienced pilots.

“Develop a process for even minor things, which you may not consider during the day. For instance, identifying controls by feel, or being aware of the pitfalls of trying to read a map with red sections on it, in a red light.

“As in daylight flying, but even more so, trust your instincts if you have a funny feeling about something. Your subconscious is evaluating the situation and alerting you that all is not well. Take notice, analyse what’s wrong, take action, and don’t plough further into uncomfortable or unfamiliar territory.

“Also, just because you’ve done it a few times does not make it safe. Question what you’ve become comfortable with.”

In an Emergency Situation

Solutions to emergencies during night flying are more complex.

Jason Frost-Evans says there are fewer opportunities to select ideal landing places.

“It’s also harder to see hazards like wires and slopes. Different lighting conditions can create problems with definition and depth perception.

“Identify alternative landing sites *in advance* and keep monitoring them as you fly.

“Having the right equipment on board is a must. For example, you need to have survival equipment to manage exposure, if you end up having to stay put somewhere isolated.”

John Harwood says while any type of engine failure represents a significant risk, at night the pilot has even fewer options.

“It’s all but impossible to choose a suitably lit landing area. The standard brief is to avoid the lit areas because they represent housing. Instead choose a non-lit area, but of course, a pilot should be aware such an area could contain obstacles such as trees, dunes, transmission masts, and power lines.

“A successful emergency landing at night really comes down to superb situational awareness, and thorough knowledge of the area.”

In Winter

Jason Frost-Evans says the length of day and night varies around the country.

“Night may fall up to an hour earlier in Dunedin than in Auckland,” he says.

“Places covered by snow at night will often look different from other times, because the land looks more uniform. It’s harder to see rivers, and harder to navigate.”

CAA Aviation Examiner, Marc Brogan, reminds pilots to be aware of increased traffic during the darker months.

“In winter, more aircraft are out in training flights at night, so fly neighbourly, and always be situationally aware.”

More Information

Email info@caa.govt.nz for a free copy of *Night VFR*, *Survival*, and *Winter Flying* GAP booklets, or view them online at caa.govt.nz, “Quick Links > Publications > *Good Aviation Practice* booklets”. ■

Clutter in the Cockpit

The cockpit is not known for its spaciousness, and can soon be filled with charts, headsets, knee boards, calculators, sunglasses and pens. Such loose items can, and do, cause serious accidents.

In January 2012, an Aerostar Yak-52 was carrying out an aerobatic flight at Feilding when – after a loop and stall turn – the pilot, at about 3000 ft, made a slow roll.

On roll out, the aircraft went into a steep dive – 45 to 50 degrees – from which the pilot did not recover. The aircraft crashed and the pilot was killed.

Accident investigators discovered that a screwdriver had been left in the fuselage. It is believed that it restricted elevator control, which did not allow sufficient nose up authority.

The screwdriver showed signs of moisture damage which led the investigators to conclude that it had remained undetected in the rear-most section of the fuselage for some time.

To help reduce the danger of this, the latest version of Yak-52 aircraft now has two Perspex® windows, either side of the aircraft, to allow pilots to inspect the interior during their preflight checks.

Bob Feasey, Hawker Pacific Ohakea, explains the tool control policy their engineers use.

“At the end of each job, the engineer must check in all tools and equipment used and check their surrounding area. The area is then checked by a coordinator.”

Aerobatic pilots spend time checking and rechecking the cockpit and personal clothing for any loose objects that may fly around the cockpit when performing aerobatic manoeuvres.

But even normally secured objects can become dangerous.

Jeanette Lusty, aerobatic pilot and CAA’s team leader of recreational aviation says she was once involved in an incident in an Air Tourer.

“I was performing aerobatics with another pilot when a ‘lockup’ occurred. That’s where the aircraft has been set up

wrongly for the particular manoeuvre, and the aeroplane ends up in a vertical position where no air movement is reacting on any surfaces of the aircraft. The pilot must neutralise the controls and wait to see if the aircraft will fall backwards or forwards. This particular aircraft did such a violent slap forward that it pulled the axe out of its secured moorings and struck the pilot in the back of the head. It also pulled the ELT connection completely out of its socket.”

Fortunately, the aircraft was stabilised and landed safely.

In 2009, a helicopter pilot reported to the CAA that, prior to taking off from Wanaka, he had loaded and secured a chilly bin on to a passenger seat, using a standard seat belt. During the flight to a private airfield, the chilly bin shook loose and moved, obstructing the helicopter’s cyclic controls.

The pilot struggled to maintain control and attempted to make an emergency landing, but eventually crashed and rolled the aircraft.

Steve Kern, CAA’s manager of heli ops, says even seemingly insignificant objects can be lethally dangerous.

“Any object loose in the cockpit has the potential to become a missile. Make sure everything is sufficiently secured before takeoff.”

In October 2015, in Afghanistan, a USAF Hercules took off on a routine night flight from Jalalabad to Bagram.

After becoming airborne, the aircraft adopted an increasingly steep climb angle. After reaching approximately 700 feet AGL, the aircraft stalled and descended rapidly before hitting the ground inside the aerodrome.

The aircraft was destroyed, and all 11 occupants were killed. Three Afghan military personnel were also killed when the aerodrome guard tower was hit by the aircraft.

“Any object loose in the cockpit has the potential to become a missile. Make sure everything is sufficiently secured before takeoff.”

The official investigation found the pilot had placed a hard-shell night vision goggles case forward of the yoke, to keep the aircraft's elevator in an 'up' position to accommodate loading operations of tall cargo.

In the 50 minutes that followed, prior to takeoff, neither the pilot nor co-pilot removed the case.

Incorrectly stowed items also had a direct impact in February 2014 when an Airbus A330 was flying from RAF Brize Norton to Camp Bastion in Afghanistan.

The aircraft was cruising at 33,000 ft when it suddenly pitched nose down. The aircraft continued like this for 33 seconds, losing 4400 ft in height, before the aircraft's self-protection measures initiated a recovery. A number of passengers and crew were injured during the dive.

A British Military Aviation Authority inquiry established that the pitch down command resulted from a digital SLR camera being placed directly behind the sidestick in the space between the sidestick and the captain's left armrest.

When the captain's seat was moved forward, the camera became jammed between the front of the armrest and the rear base of the sidestick causing the aircraft to dive.

The CAA's Training and Standards Development Officer, David Harrison, says pilots must remember the importance of 'full and free movement'.

"During that final check before takeoff, get your knee board, clipboard and other paraphernalia around you, as you would have them during the flight. Then check for full, free and correct movement of the controls.

"If something untoward then happens during the flight, you've done what you can to ensure it doesn't interfere."

CAA's Principal Aviation Examiner, Bill McGregor, emphasises the importance of checking for loose and random items.

"It's well worth taking the extra time to have a look around for unsecured or poorly stowed items. And fixing them. Obviously it will make the cockpit a safer environment but it will also prevent even a small, relatively harmless item suddenly coming loose and giving the pilot a nasty scare."

Bill says the pilot carrying out a postflight has a role to play as well.

"Make sure you take away all your own equipment, possessions and litter. Don't rely on the next pilot to check." ■



Safety investigators looking into a fatal crash in 2012 concluded that this screwdriver had remained in the rear-most section of the fuselage for some time.

So You Don't Think You Need a NOTAM?

The failure to consult NOTAMs and AIP Supplements is keeping CAA safety investigators busy examining potentially deadly occurrences.

On 10 February 2017, Department of Conservation Golden Bay Operations Manager, Andrew Lamason, requested a temporary restricted area be put in place at the bottom of Farewell Spit.

Over three days, more than 600 pilot whales stranded in the Triangle Flat area, and “hundreds and hundreds” of volunteers turned up to try to get them back out to sea.

“Just eight DOC officers had to coordinate all those volunteers, direct a massive amount of road traffic, and of course, look after the animals,” says Andrew.

“Helicopters, mainly transporting reporters, arrived, landing in the middle of it all. Then the drones came, whooping across the top of the stranding ground.

“Our first priorities were the animals, and the safety of the

people around them, but the chances of a disaster in such circumstances were reasonably high.

“The restricted area gave us a modicum of control, at least of airborne traffic.”

Despite a NOTAM advising pilots of the restricted airspace, two helicopters soon swooped in.

“Which made us think,” says Andrew, “what was the point?”

Further south, near Kaikoura, and at about the same time, Lindsay Bell was shaking his head at a similar lack of professionalism.

Lindsay is the aircraft operations manager for the stabilisation of ‘northern slips’ on State Highway 1, caused by the November 2016 earthquake.



(A0287/17 NOTAMN
Q) NZZC/QRTCA/IV/BO /W /000/020/4030S17243E015
A) NZZC B) 1702100109 C) 1702120001
E) TEMPO RESTRICTED AREA NZR691 (FOSSIL POINT, FAREWELL SPIT)
APRX 19NM N NZTK, IS PRESCRIBED AS FLW:
ALL THAT AIRSPACE BOUNDED BY A LINE JOINING
S 40 29 58.8, E 172 44 26.5
S 40 30 54.2, E 172 45 24.5
S 40 31 22.0, E 172 44 01.5 (PUPONGA HARBOUR)
S 40 30 06.3, E 172 42 58.2 (PILLAR POINT)
S 40 29 48.3, E 172 42 54.3
S 40 29 58.8, E 172 44 26.5
ACTIVITY: MARINE STRANDING
ADMINISTERING AUTHORITY: DEPARTMENT OF CONSERVATION
PRESCRIBED PURSUANT TO CIVIL AVIATION RULE PART 71 UNDER A DELEGATED
AUTHORITY ISSUED BY THE DIRECTOR OF CIVIL AVIATION
F) SFC G) 2000FT AMSL)

“At any one time, we have had up to 13 helicopters in the air: some with 1300 kilograms of water slung on long lines underneath – to sluice the loose material on the hillside – and others transporting geologists and abseilers and other specialist personnel.”

There was a NOTAM issued advising pilots of the temporary restricted area (NZR893 Clarence), approximately 1 NM out to sea and 1 NM inland from the coast, and up to 1500 ft.

Despite that, there have been “two to three incursions a week” into the restricted area.

“With 1300 kilos of seawater slung underneath your machine, you can’t turn or avoid in a hurry. You’re keeping an eye on the bucket, you’re keeping an eye out for the other helicopters, you’re working close to the hillside, and you’re taking direction from the geologists about where to drop the load.

“Then some idiot comes straight in, sometimes at a height below that of the helicopters, on the wrong frequency, with no radio call to notify us or request to come through.

“Some of them have given our guys a helluva fright. It’s lazy and dangerous, or it’s stupid and dangerous.”

CAA Aviation Safety Adviser, Carlton Campbell, says such occurrences are all too frequent.

“Airport operators often have issues with pilots landing on runways with work in progress, and that are consequently closed and ‘NOTAMed’.”

Despite the fact that obtaining a NOTAM is free, there have been, in fact, 65 reported occurrences in the last six years, due

to non-compliance with a NOTAM or AIP Supplement.

“Nowadays, pilots often complain about drone activity, and how dangerous it is, but often, they haven’t consulted the NOTAMs to find out the drone flights are, actually, notified.”

Carlton visited the Kaikoura northern slips site during the sluicing operation.

“While I was there, a C152 went through at 700 ft. There were 11 helicopters in the air at the time, and about six of them made alarmed calls about this guy. The pilot had radioed that he was coming through, but hadn’t got permission, let alone a briefing, to do that. He obviously thought his couple of calls were enough.

“At the very least, the Cessna was a distraction to the heli pilots, who were absorbed in a busy operation requiring their maximum attention.

“Incredibly, he returned shortly after, at 1000 ft, still in restricted airspace, again without approval.

“Guys like that, their ignorance *will* catch up with them one day.”

Chief Flying Instructor of Canterbury Aero Club, Nathan Clarke, believes some pilots don’t consult NOTAMs because they fly mainly in their home area.

“Heli and fixed wing pilots operating in remote areas or on regular routes within their own patch are particularly at risk.

“On the day they do have to fly further, they forget to check NOTAMs, or forget how to do it, or ignore their significance,” he says.

Continued over >>



Photo courtesy of Kurt Sharpe, Department of Conservation.

“All too often when I broach the topic I get a flippant ‘Who checks NOTAMs?’ response, as if it’s not an essential part of a standard preflight routine.”

» Continued from previous page

Of course, even if such pilots were to never move much beyond their home base, they assume that area will never be closed in an emergency.

Nathan Clarke says the other type of AIP-ignoring pilot is the ‘alpha male’.

“I’ve been in meetings with pilots who say, ‘I haven’t got time to be pissing around with that sort of thing’ and they don’t care that it’s a legal requirement.

“I show pilots how to obtain the NOTAMs, but I’m disappointed when I realise that they won’t bother checking, even before their very next flight.”

Carlton Campbell believes some pilots are embarrassed they can’t interpret NOTAM ‘language’, and that’s why they don’t consult them.

“All too often when I broach the topic I get a flippant ‘Who checks NOTAMs?’ response, as if it’s not an essential part of a standard preflight routine.

“I suspect there’s a lack of confidence in being able to decipher the message, given some aspects are not in plain language.”

But Nathan Clarke believes that’s often just a symptom of a wider disengagement from the system.

“They don’t understand the language because they don’t use it regularly and don’t know where to find the meaning of the abbreviations. The fact they don’t bother to get a refresher on the language reflects their belief they’re a sole operator, not part of an interconnected safety ‘system’.”

Possibly the best opportunity for communicating the importance of consulting NOTAMs and AIP Supps is during a Biennial Flight Review.

“Pilots are motivated to learn how to consult and understand them, and with any luck, that will remain with them,” says Carlton.

Careful Reading, Careful Wording

CAA Safety Investigator Siobhan Mandich – who’s been examining a number of recent occurrences directly emerging from confusion surrounding NOTAMs – says pilots have to be careful when they read them.

“Some aerodrome designations can be similar, such as CS for Cromwell Racecourse aerodrome, and CW for Cromwell aerodrome.”

A review of NOTAM-related occurrences over the last few years indicates that some pilots may know a NOTAM has been

issued for a particular aerodrome, but think they can handle the risk, ‘Oh, I’ll just do a touch and go.’

But there might be a big hole in the surface of the runway, or, as in a recent instance, people actually on the runway.

Siobhan Mandich says the parties requesting the restricted airspace also have a role to play.

“For instance, event organisers may have requested restricted airspace above their event, or a runway closure. A NOTAM may have been issued. But that does not mean they can relax, assuming everyone has read or understood the NOTAM. They still need to keep an eye out for errant pilots and keep a radio watch so they can quickly contact them.”

Roger Shepherd, CAA’s Investigating Officer of Aviation Related Concerns (ARCs) says that organisations asking for a restriction or closure need to be careful how they word their request.

“I’ve investigated a few ARCs where the mowing gang or council is very aggrieved that an aircraft landed when a NOTAM was issued for just that – mowing. Except it neglected to actually say the runway was closed.

“Clear language is everything.”

Safety investigator Steve Rogers says an occurrence he recently looked at highlights the need for pilots to always take the responsibility for checking NOTAMs.

“Even if pilots are used to, say, the local air traffic service telling them whether one is in place,” he says.

The occurrence Steve investigated involved the controller omitting to tell a group of eight pilots about a NOTAM, and the pilots assuming therefore, there wasn’t one.

“All eight, a short time later, barrelled through the activated restricted area above snow-bombing near the Homer Tunnel.

“They’d all become so used,” says Steve, “to this de facto operational practice of the ATS telling them whether an activation NOTAM was in place, that they’d become completely reliant on it.





“But that does not in any way absolve them from checking for themselves. It’s an integral part of a preflight. You check the weather, you decide on your alternate (landing spot, should the first not be available for some reason) and you check your NOTAMs and Supps.”

CAA’s Aeronautical Services Officer, Paula Moore, agrees.

“Part of a preflight briefing includes obtaining and reading the current information relevant for the flight contained in the AIP Supp and NOTAM.

Paula says pilots must understand the information in the Supp is not duplicated in the NOTAM and vice versa.

“The NOTAM may refer to further details contained in the Supp, but **both** must be read to be fully aware of the current status of airspace, navigational aids, aerodrome availability, etcetera.

“Temporary changes of long duration (three months or more), and information of short duration which contains extensive text and/or graphics are published as AIP Supplements.

“NOTAMs are issued when there’s insufficient time for the distribution of an AIP Supplement, ie, less than 90 days notification.”

Paula also says it’s not enough to check for a NOTAM only once – before flying.

“Pilots should be updating their knowledge en route. They need to check with FISCOP that a new NOTAM has not been issued, since they became airborne, activating a temporary restricted/danger area on the route they are flying, or closing their destination aerodrome.”

Further, pilots often look at the aerodrome list of NOTAMs to find those relevant to them, but fail to look in the en-route section where there may be information critical to their flight.

Not If, But When

RNZAF Squadron Leader Jim Rankin organises about 20 air force flying displays a year. At least once a year, he says, someone busts the restricted area put in place around the display.

“Some years ago, an Iroquois was practising for Warbirds Over Wanaka, when he radioed the tower to say, ‘there’s a Cessna coming in on final’.

“I was in the tower with the controller and when we looked, sure enough, there was a Cessna, on about a one mile final,

couple of hundred feet. We tried to call him on the frequencies that were in the Supp, but got no response.

“They eventually got him on the unattended aerodrome frequency, told the guy to vacate the area, and to phone the tower when he eventually landed elsewhere.

“About an hour later he phoned from Omarama:

‘Were you aware there was an airshow on?’ he was asked.

‘No.’

‘Did you read your AIP Supplement or NOTAMs?’

‘I thought I had, but obviously I missed it.’

‘OK, can we speak to your instructor please?’

‘I am the instructor.’

“We found that pretty hard to believe, that an instructor could get it so totally wrong. We were looking at a potential catastrophe.”

Jim believes it’s “definitely” a matter of when – and not if – there’s a mid-air collision.

“We have two observers on the ground now, whose sole job it is to scan the sky and warn us if someone is coming in. That’s actually in our Standard Operating Procedures.”

Jim, who’s based at Ohakea, says some military operating areas (MOAs) are permanently active, and some are notified by NOTAM.

“In active MOAs, there can be shells flying, big bangs, some pretty big projectiles being lobbed around. Fly through that, and life could get really bad, really quickly.” ■



Further information

Email info@caa.govt.nz for a free copy of our *Check NOTAMs and AIP Supps* poster. It comes in both A4 and A2 sizes.



An Update on **AC43-14**

It's approaching a year since the Advisory Circular that provides acceptable technical data for *some* avionics modifications was updated. Overall it's working well, but the airworthiness team would like to give you a few pointers.

Advisory Circular AC43-14 *Avionics, Installations – Acceptable Technical Data* is a tool for simple installations, instead of having to apply for a modification every time you want to do something small.

"It's kind of a privilege, it circumvents the normal design change rules," says Clayton Hughes, the CAA's Airworthiness Engineer, Avionics.

"In return we expect certain things, like filling out paperwork properly."

AC43-14 was revised to make it easier to use. The 337 form was replaced with CAA043-01, found at, www.caa.govt.nz, "Quick Links > Forms".

The main requirement in the AC is that equipment is installed on a no hazard, no interference basis.

Sage Advice

Even though the form has space to list multiple pieces of equipment, sometimes you're better off doing a separate sheet for each item so it doesn't get too unwieldy.

Even if you think some weight and balance changes are negligible, they still need to be recorded. The same is true for Electrical Load Analysis (ELA).

If you are removing or installing equipment in the same process, clearly make the distinction when you fill out the form.

Definite No-Nos

Fitting agricultural GPS units is excluded in AC43-14.

Mode S transponders are not approved for AC43-14.

Appendix 9 is not a 'cover-all' for items not mentioned elsewhere in AC43-14.

Mixing and matching different sections out of different appendices to try to achieve a modification that isn't covered by AC43-14 is unacceptable. The main text and the entire applicable appendix must be followed.

Did You Know?

If a CAA2129 needs to be amended after a modification, you don't need to post it, just email a scan of it and the CAA043-01 to avionics@caa.govt.nz.

If you neglect to send in a CAA043-01 when you should, that effectively means it's a non-approved modification. ■

PPL Medicals – Have Your Say

The CAA recently reviewed the requirements needed to get a medical certificate for a Private Pilot Licence. It's considering various options for the future, including keeping things as they are.

The CAA is now consulting on whether the current medical certification requirements for the PPL are justified, in terms of both cost and the standard of physical fitness required, relative to the level of risk posed by PPL holders.

This follows moves in the United Kingdom and the United States to introduce alternative private pilot licences with reduced standards of medical certification, and an associated reduction in privileges.

The consultation document is considering the costs and benefits associated with:

- » retaining the status quo;
- » an alternative CAA aviation licence;
- » the New Zealand Transport Agency (NZTA) commercial driver licence medical standard;
- » the NZTA private driver licence medical standard;
- » a self-declaration system; and
- » any other options the aviation community may identify.

Following analysis of submissions, the CAA will consider whether to introduce an alternative standard.

Any decision to amend the Civil Aviation Rules would follow the normal policy and rule development process.

To find out more, go to www.caa.govt.nz/ppl-medical-review. Submissions close 5 pm, 19 June 2017. ■

CAA Flight Instructor Seminars 2017

- » Wellington – 1 to 2 August, Brentwood Hotel.
- » Ashburton – 8 to 9 August, Hotel Ashburton.
- » Hamilton – 15 to 16 August, Distinction Hotel.

For more information, and to register, go to www.caa.govt.nz, "Quick Links > Seminars and Courses".

Then scan your completed registration form, and email it to licensing@caa.govt.nz, with "Attn: FI Seminar" in the subject line. ■

SMS – Your Deadline, Your Responsibility



A number of organisations are approaching the deadline for certification of their Safety Management System (SMS) and it's critical they stick to it.

Organisations have begun submitting their SMS implementation plans, which tell the CAA what they're going to do and *when* they're going to be ready for certification.

The plans that have been approved will include a date for implementation approved by the Director. This is the date that an organisation's SMS must be certified by.

Chris Lamain, the CAA's SMS Implementation Lead, says individual organisations nominated a date when they would be ready to fully implement their SMS.

"Their plans told us how they are going to get there, the gaps that needed addressing, the timeline, and the resource required to do it," says Chris.

"We've looked at the plan, its feasibility – the tasks, proposed resource, and timeline to implement – and the CAA's ability to certify the organisation at the proposed date for implementation. Based on this information, the Director has approved a date for implementation for each organisation."

He says there is a practical reason for that.

"We don't have the capacity to process and certify all organisations at once on the final date for certification required by the rules."

While the rules set a final date for certification, organisations should not make the mistake of thinking they have leeway if they nominated an earlier date.

"We can't give extensions to all of these participants. There's a regulatory date here – the date approved by the Director," says Chris.

"We've never regulated this way before – normally it's a fixed date. This time we said 'you tell us how you are going to do it'. The CAA gave them some latitude."

There is a regulatory process for managing participants who don't meet their deadline.

For more information about SMS, including where to send questions, go to the CAA web site, www.caa.govt.nz/sms. ■

Trialling SBAS

Satellite-Based Augmentation System technology is the new frontier for providing increased accuracy of positioning and it's about to be tested here.

New Zealand and Australia are working together on a trial of SBAS technology.

Land Information New Zealand (LINZ) is managing the trial here, focusing on applications across nine sectors, including road transport, mining, maritime transport, and aviation.

Because the technology itself has been proven to work overseas, it's more about testing the benefits and quantifying them.

The technology, which is already in use in other countries, improves the accuracy of GPS so that highly accurate positioning information could be received across New Zealand in the future.

The Director of New Southern Sky (NSS), Steve Smyth, says "It's an aspiration of the NSS programme to be able to take advantage of SBAS capability, whether it's to provide increased navigational accuracy for safety or by enabling greater access to smaller regional airports in poor weather."

The test signal will be transmitted from 1 June, 2017, with the trial running until February 2019.

SBAS project coordinator, Heidi Jordan, says information will be issued by NOTAM and web sites to ensure the aviation community is aware of the test transmissions.

The test signal does not meet the 'safety of life' requirements for aviation and will not be used for approved navigation operations in New Zealand.

There are aircraft in New Zealand capable of utilising SBAS signals; however the test signal has been configured so aviation-approved navigation systems will ignore the signal.

"It's a test signal (Bit 0 set), so TSO-approved aviation equipment will know to ignore it. But if an operator observes that their equipment is not functioning the way they expect, they should report that to the CAA," says Heidi.

Non TSO equipment used in aviation is also expected to ignore the test signal. Any GPS equipment used in the aviation sector, such as in agricultural applications, should be monitored, and any suspected interference reported.

Reporting will be via the Part 12 incident reporting process quoting 'SBAS Issue' in the description.

In April 2017, LINZ called for expressions of interest for participation in the trial.

More information is available from LINZ at www.linz.govt.nz/sbas. ■

How to be a Chief Flying Instructor

A new booklet is available for rookie CFIs, or those who fancy being in the job.

The role of Chief Flying Instructor is complex, busy, and highly skilled.

A CFI has oversight of student progress and supervision of instructors. They keep an eye on the organisation's training programmes, maintenance of its aircraft, and its health and safety practices. They make sure everyone has the resources they need to do a good job, and in small organisations, they might also have to have oversight of the finances.

An effective CFI also has many positive personal qualities. Among them are leadership and mentoring skills, the ability to pass on passion and motivation, and to resolve conflict.

Whew. It's a wonder anyone wants to be a CFI, let alone can make a success of it.

But there are plenty of people who are doing a great job of it.

Many of them have contributed to the new booklet *How to be a Chief Flying Instructor*.

It's designed to assist CFIs newly appointed to an aero club or flight training organisation – or those about to be, or those who want to be – with the special responsibilities associated with the position.

For a free copy, email info@caa.govt.nz. ■



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 purchased from your training organisation, or 0800 GET RULES (0800 438 785).

Rules, Advisory Circulars, 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 Aeropath (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	Aeropath (Airways) Cut-off Date	Effective Date
7 Jun 2017	14 Jun 2017	17 Aug 2017
5 Jul 2017	12 Jul 2017	14 Sep 2017
2 Aug 2017	9 Aug 2017	12 Oct 2017

See www.caa.govt.nz/aip to view the AIP cut-off dates for 2017.

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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Email: Steve.Backhurst@caa.govt.nz

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-NPG Cessna 152

Date and Time:	01-Mar-2016 at 12:30
Location:	Kaitoke airstrip
POB:	2
Damage:	Substantial
Nature of Flight:	Private other
Pilot Licence:	Private Pilot Licence (Aeroplane)
Age:	33 yrs
Flying Hours (Total):	80
Flying Hours (on Type):	80
Last 90 Days:	8

The pilot was conducting a local flight to the Kaitoke airstrip. On his first approach to land, he mis-judged the approach and went around. He then made the decision to attempt another approach. On this approach, he was too high and fast, and the aircraft touched down well into the airstrip. The aircraft bounced and the pilot initiated a go-around. He then retracted the flap before applying power, which resulted in the aircraft landing heavily in a nose down attitude on the airstrip. The heavy landing resulted in the failure of the nose wheel and right main wheel assembly, followed by propeller contact with the ground.

The aircraft was substantially damaged. The pilot and his passenger were not injured. Following the accident, the pilot has completed remedial training with the CFI and also completed his PPL cross-country training. The pilot also gave a presentation to club members at a pilot's night recounting the events and 'lessons learned' from the accident.

CAA Occurrence Ref 16/835

ZK-DOJ Piper PA-32S-300

Date and Time:	05-Aug-2014 at 14:59
Location:	Alexandra
POB:	3
Damage:	Destroyed
Nature of Flight:	Transport passenger A to B
Pilot Licence:	Private Pilot Licence (Aeroplane)
Age:	56 yrs
Flying Hours (Total):	2179
Flying Hours (on Type):	350
Last 90 Days:	9

The aircraft was on a sightseeing trip visiting various "Lord of the Rings" film locations. After a brief stop at Omarama, the aircraft headed for the next landing on the Bonspeil Station airstrip near the Poolburn Reservoir.

Information indicates that the pilot made a wide left circling approach over the Poolburn Reservoir before overflying the airstrip at about 100 feet AGL. Little height was gained after overflying the strip.

The indicated flight path generally followed a normal curved approach until the aircraft was in an approximately downwind position, where a distinctive left turn was made back in the general direction of the airstrip.

Shortly after this heading change, the aircraft entered a high vertical rate of descent, with little forward momentum, resulting in impact with the ground.

On locating the aircraft, it was confirmed that the pilot was deceased and the two passengers were seriously injured.

The Transport Accident Investigation Commission report 14-004 is available on their web site, www.taic.org.nz.

CAA Occurrence Ref 16/3583

ZK-FPH Cessna 152

Date and Time:	23-Nov-2016 at 14:12
Location:	Feilding
POB:	2
Damage:	Substantial
Nature of Flight:	Training dual
Pilot Licence:	Private Pilot Licence (Aeroplane)
Age:	23 yrs
Flying Hours (Total):	502
Last 90 Days:	40

During the final approach to land, a glide approach with a crosswind was attempted. During the landing phase, the aircraft was caught by a gust of wind causing loss of control. A runway excursion resulted with the aircraft coming to rest in the long grass beside the runway. The aircraft received substantial damage to the left wing tip, propeller, nose landing gear, and forward fuselage. The crew were uninjured.

Following a dual training exercise away from the circuit, it was decided to conduct a series of circuits including flapless and glide approaches.

During the first touch and go, for a flapless landing, the crew noticed a crosswind from the left. This was corrected for on the touch-down. The student then fell short on two glide approaches and carried out go-arounds. On the third circuit, they decided to make a glide approach and full stop landing.

As soon as the aircraft touched down, it started going off the runway to the left with its right wing down. As the aircraft was heading for the grass on the left, the instructor took the controls and applied full power to initiate a go-around. The aircraft became airborne, but drifted to the right of the runway with its right wing down. The aircraft then descended, and struck the ground with its nose wheel and right wing. After the aircraft came to a full stop, smoke started to come out of the instrument panel. The aircraft was secured and the crew evacuated because of the risk of fire.

An instructor on the ground estimated the crosswind component to be 15 to 20 knots. The maximum demonstrated crosswind component for the Cessna 152 is 12 knots.

The company investigation identified that low instructor experience and lack of guidelines and SOPs were factors in the accident.

CAA Occurrence Ref 16/6319

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

Cessna 208B

Flap Motor CB

Part Number: S1232-510
ATA Chapter: 2750

While attempting to retract the flaps after takeoff, the flaps failed to retract and remained at 5 to 10 degrees. An attempt was made to retract the flaps using the standby system. On un-guarding the switches, a cracking noise followed by an arcing sound was heard, then an electrical burning smell was noticed. The 'ENG FIRE' and 'Fuel Off' annunciators activated.

The aircraft returned safely to the aerodrome where a partial flap landing was carried out.

Maintenance investigation found that the main flap motor had an electrical short when 'Flap Up' was selected. The circuit breaker failed to trip, and the associated wiring melted because of heat caused by the high current.

The damaged wiring and associated parts were replaced and the aircraft returned to service.

As a precautionary measure at the time of the incident, the remaining C208 fleet were inspected for weathertightness around the cockpit and upper fuselage area.

Also, a 12-monthly repetitive scheduled item was added to the operator's maintenance tracking system to manually cycle off and on the circuit breakers, and detect if any are excessively tight or loose.

As a further precaution, the decision was made to replace the remaining main and standby flap circuit breakers in the C208 fleet.

[CAA Occurrence Ref 16/5153](#)

Piper PA-32R-301

Tyre/Tube

ATA Chapter: 3200

The pilot approached and landed at a faster speed than normal due to turbulence. This in turn required heavy braking which wore a flat spot on the tyre and ruptured the tube. The runway was NOTAMed closed and a new tyre and tube fitted.

[CAA Occurrence Ref 16/3833](#)

Guimbal Cabri G2

Exhaust Valve Guide

Part Model: O-360-J2A
Part Manufacturer: Lycoming
TSI Hours: 36.2
TTIS Hours: 442

On start-up the pilot reported rough running of the engine.

The maintenance provider found that the #3 exhaust valve was stuck open. This was believed to be due to carbon buildup in the guide. The guide was reamed as per Service Instruction 1425A and the issue has been resolved.

[CAA Occurrence Ref 16/5289](#)

Hughes 369D

Rollover Valve

Part Manufacturer: Rollover Valve
Part Number: 369H8108.505
ATA Chapter: 2820
TTIS Hours: 12899

While conducting agricultural spraying operations, the helicopter had a loss of engine power during cruise. The pilot identified the decreasing rotor RPM, and executed an autorotation to a paddock short of the loading area.

The engineering investigation found that the fuel vent line emergency shutoff valve or 'rollover valve' (part number 369H8108-505) failed in the closed position, and the fuel bladder collapsed. The deformation of the bladder prevented the fuel quantity transmitter from moving freely, and the fuel quantity indicator displayed 150 pounds remaining at the point of fuel exhaustion. The engineer replaced the fuel vent line shutoff valve and calibrated the fuel quantity transmitter.

MD Helicopters issued a service bulletin that addressed fuel vent line emergency shutoff valve failures due to possible degradation over time (Service Information Notices HN-234.1, DN-181.1, EN 73.1 and FN-60.1, dated 10 September 1992). The inspection and rework of the fuel vent system was last completed in accordance with Airworthiness Directive DCA/HU369/61 in October 2011. The total time accumulated on the aircraft was 1607.9 hours. The company plans to install an additional fuel flow indicator to increase fuel monitoring accuracy and provide a redundant system for fuel quantity monitoring.

[CAA Occurrence Ref 16/5839](#)

Aviation Safety Officer Course

Taupo

27 to 28 July 2017

Suncourt Hotel &
Conference Centre
14 Northcroft Street, Taupo

Dunedin

21 to 22 September 2017

Scenic Hotel Southern Cross
118 High Street, Dunedin

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 Officer.

Attend this free two-day course to understand the role of a safety officer, or for those who are already in a safety role, to refresh your skills.

You will get comprehensive guidance material and access to all the latest CAA safety resources and support.

Lunches are provided (but you will have to arrange and pay for your own accommodation, transport, and other meals).



Take a step on the ladder to SMS



FUEL FOR THOUGHT



The runway behind you,
The air above you,
and the fuel you left behind...

Whether you're starving for new information, or too exhausted to find out the real gas, there's more to fuel than you think.

To understand more about the fuel system in *your* aircraft, at the seminar you'll get early access to our new app, *Know Your Aircraft*.

AvKiwi Safety Seminars are FREE – all the venues are shown on the map (more dates and times will be added as they become available). See the CAA web site, www.caa.govt.nz/AvKiwi for updates, and for online courses from past seminars.

The seminar has been presented in Feilding, Kapiti, Palmerston North, Stratford, Wellington, Invercargill, Dunedin, Oamaru, Timaru, Ashburton, Christchurch, Greymouth, Franz Josef, Wanaka, and Queenstown.

