

# vector



## WARBIRDS OVER WANAKA

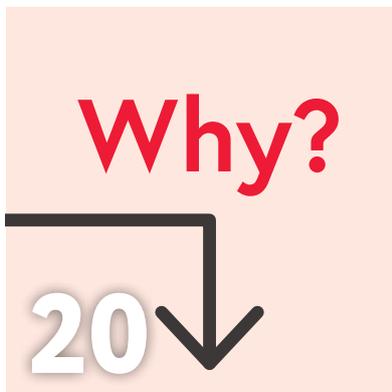
Root cause  
analysis – the  
five whys

The ins  
and outs of  
Hamilton

With aerodrome  
safety, size  
doesn't matter



// THE INS AND OUTS OF HAMILTON



// ROOT CAUSE ANALYSIS – THE FIVE WHYS



// WITH AERODROME SAFETY, SIZE DOESN'T MATTER

Cover: Photo courtesy of Warbirds Over Wanaka.

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I learned about flying from that //

# THE TAKE-OFF THAT APPROACHED DISASTER



This story from the archives shows how even an experienced and skilled pilot can become complacent.

After leaving the air force, Jack secured himself a prestigious job flying a four-seat Percival Proctor Mark 5 for a prominent motor dealership with branches in New Plymouth, Auckland and Whangārei.

The Proctor had evolved from Percival's pre-war racing aircraft, and early models had sparkling performance, superior to contemporary American Cessnas and Pipers.

Regrettably the later, larger, heavier Proctor Mark 5 had inferior performance compared with the Marks 1, 2 and 3.

Jack would regularly fly the Mark 5 to any of the company's branches, and on the day of this story, had been called to fly three branch managers to New Plymouth.

Flying conditions were perfect and the somnolent roar of the Proctor's Gypsy Queen engine soon lulled his three passengers to sleep.

"Wind variable at less than four knots, temperature two four, altimeter setting one zero three zero. The kettle's on if you want a cuppa," New Plymouth Tower reported on first contact.

Misjudging his straight-in approach to the south-east runway, Jack ended up high and fast, necessitating early application of full flap. The aircraft initially ballooned upward before achieving the correct approach profile, crossing a field of grazing dairy cattle before landing on the runway's long grass surface.

Jack taxied to the aero club and cut the engine. The sudden silence roused his passengers. "Nice flight, Jack," the senior member of their party commented. "That's how I like it. See you back here around 2.30. Fill 'er up and we'll be home in time for afternoon tea."

Jack headed toward the aero club after re-fuelling. "Lovely day for flying," the CFI commented. "They were supposed to have cut the grass yesterday. Recent rains have made it grow a lot."

Conversation then ranged over the usual topics discussed by flyers – employment, new aircraft, pay, and working conditions.

Temperature and barometric pressure increased considerably over the next two hours, prompting Jack to open the cockpit doors to cool the cabin.

His passengers returned at 2.30. "All set then," the party's leader announced. "Gotta heavy box to go in the back locker if you don't mind."

Jack loaded the box while his passengers boarded. »

» It was 28 degrees C, and the wind light and variable. There were patches of cumulus at 1500 ft, and the barometric pressure now 1032 mb.

With full tanks, three heavy passengers and more than 15 kgs of luggage, the aircraft was probably at its maximum take-off weight. But runway length of 1200 metres was more than enough for their requirements.

Out on the airfield, a hawk circled in a thermal.

The temperature had risen another degree by the time Jack lined up on the north-west grass runway. He chose not to use flaps for take-off.

“All set?” He turned toward the rear seat passengers. “OK then, here we go.”

But they were already asleep.

Maximum weight, high temperature and pressure, local thermal activity causing wind shift – and something else...

Opening the throttle gradually and initially holding the control column back to assist directional control, Jack concentrated on tracking straight while checking his instruments.

RPM 2400, boost pressure over 14 inches, engine instruments within limits, air speed not indicating yet.

Overhead, the hawk had centred in on a thermal to their right.

Jack centred the control column when the aircraft felt light on its wheels, noting the airspeed had moved off its stop. Aero club members watched as he passed the halfway mark, still earthbound.

Forty knots and 500 metres of runway remaining, the airspeed wasn't increasing. Jack checked throttle and pitch levers fully forward, the brakes were off but the airspeed seemed reluctant to increase.

Forty knots still, and 400 metres of runway remaining. Now 45 knots. A Proctor will stall at 52 knots with the flaps up and 44 knots with full flap extended.

One hundred metres of runway remaining and they weren't going to make it, but it was too late to stop the take-off.

Over on the other side of the wooden airfield boundary fence, the dairy cows had ambled to the milking shed.

Airspeed increased slightly and the aircraft felt lighter on its wheels. But it still refused to become airborne when Jack cautiously eased the control column back.

There was now insufficient runway remaining to abandon the take-off.

A desperate idea occurred to Jack as the aircraft entered the grass over-run area.

Cranking down full flap, the aircraft ballooned up in ground effect, as the flaps extended to the full down position.

They cleared the wooden fence by less than a metre.

Fifty knots of airspeed now but the Proctor refused to remain airborne, touching down on the close-cropped grass surface of the dairy farm paddock.

Sixty knots now and accelerating, Jack felt emboldened to cautiously ease the control column back, while slowly milking the flaps up to the take-off position. Ahead, a line of Macrocarpa trees waited to entrap him and his passengers. Sixty-six knots now and increasing.

Converting his speed to height, Jack cleared the trees by scant metres.

At 70 knots, 200 feet altitude and climbing at 400 feet a minute, Jack turned on to course. He didn't dare imagine what his passengers were thinking.

“He didn't consider that the thermalling hawk and patchy cumulus were warning him of possible wind shear with tail wind on take-off.”

The flight home gave him time to partially recover from his narrow escape, but as he touched down on Ardmore's grass runway 25, he noted his hands were still shaking.

An embarrassingly long silence ensued after he parked and shut down.

Anticipating some adverse comment would be passed to head office about the recent incident, Jack busied himself recording the flight times.

"Yes, well er... I'm sorry about that," he muttered apologetically. "This old girl doesn't perform very well on long grass, with heavy loads and high temperatures..."

When nothing was said in reply, Jack opened the cockpit doors noisily and announced to the passengers in the rear cabin that they had arrived.

"Quarter past three, gentlemen. You should be home in time for ..."

They were asleep.

"We've arrived," he repeated. "My apologies for the..."

"Nice flight!" one interrupted, waking up and rubbing his eyes to counteract the soporific effects of the lunchtime beer. "I slept the whole way."

"Yeah, that's how I like it, Jack." The leader of their party had awoken.

"Nice quiet flight, no dramas. See you next week for the Whangārei trip then, eh?"

In his favour Jack had thought outside the square when disaster seemed inevitable, and came up with a unique solution that saved them all.

But he never did tell his passengers about the incident – his rationale being that he wanted them to retain their confidence in executive travel...

He did, however, share the experience with fellow pilots, so they could learn what he had learned.

## What did Jack learn?

He realised he:

- was in too much of a hurry to "get home in time for tea"
- didn't consider all parameters before take-off, especially the effect of long grass on the take-off run
- didn't consider that the thermalling hawk and patchy cumulus were warning him of possible wind shear with tail wind on take-off
- ignored the effect of weight, density altitude and temperature on aircraft performance
- didn't make a decision to abort the take-off early enough when sufficient runway remained
- did not reconsider his decision not to use flaps for take-off in view of the state of the runway (long grass). ➡



# TAKING DRONE SAFETY SERIOUSLY

The chief executive officer of NZ Drones may be only 19 years old, but he's taken on his responsibilities regarding safety like someone who's grown wise with years of experience and close calls.



At 16, when most are considered to be way off adulthood, Jack Scott established his own drone photography company. It brought together a lifelong fascination with model aircraft and enthusiasm for videography.

Since then, NZ Drones has become Part 102-certificated, with Jack leading the development of the company exposition. He's attended numerous UAV operating and aviation safety courses, completed a drone night rating course and is working towards his PPL to improve his aviation knowledge.

Jack's incorporated SMS principles into the NZ Drones ops manual, even though Part 102 organisations are not required to.

"I've got a really strong attitude towards safety," he says.

"I regard drones as I do manned aircraft: if you're flying over people and property, or in the same airspace as manned aircraft, and you lose control of the C2 link<sup>1</sup>, the result could be catastrophic."

To the disgruntlement of an early client, he turned down a well-paying job of operating a drone over a street parade – on safety grounds.

And another client, a real estate agent, wanted a view of the property he was selling, that would have required Jack to fly into the confines of the airport, and potentially into conflict with manned aviation.

Again, he refused to undertake the assignment because he felt there was "really no safe way to do it".

As noted in his nomination for the CAA's inaugural Young Aviation Professional Award in 2019 (he was one

of three finalists), "It is an exceptionally hard thing for a young man who owns a business to turn down income. But this simply demonstrates Jack's maturity, and his ongoing commitment to safety".

## Constantly building safety

The NZ Drones' exposition is a living document, according to Jack.

"We don't say, 'okay, we have an exposition, now we're safe'. We're always amending it to make sure it's current, and to make it more easily understood. That makes it easy for staff and contract pilots to comply with it."

NZ Drones has also made it convenient for anyone to report an incident. Jack has developed a writable PDF, which means staff and contractors can fill out a report on their tablet, then upload it to the company's server.

"We meet regularly to review reports," says Jack, "and talk about whether something needs changing, or if we can do something better. We brainstorm a whole lot of ideas, write them down, and consider implementing them if they're appropriate."

Jack has also hired staff whose attitudes reflect his own. His safety manager Mick Turner plays a big part in the operations of NZ Drones.

"Mick is always there to give me new ideas on how to improve safety," says Jack.

Many of the company's clients have little understanding of drone operation safety, and Jack finds himself often patiently explaining what he will, or will not, do because of safety considerations.

<sup>1</sup> The C2 link is the radio frequency connection between the control unit and the drone itself.

# // Drones are not toys – despite being easily purchased. //



// Jack Scott, CEO NZ Drones.

“Sometimes they think it’s okay to just go with the lowest price operator, because to begin with, they think it’s just about price. But most clients do come to understand that you can’t put safety in jeopardy just to get a low price.

“We show clients our operating procedures and maintenance checklist, what we do to train our pilots, and our preflight procedures: it all helps to convince them of the advantage of going with a safety-conscious company.”

Part of Jack’s commitment to safety includes selecting the best equipment for the job. He says that in Wellington particularly, many of the commercial off-the-shelf drones are not up to operating in high winds.

“But I’ve managed to get access to military grade drones,” Jack says, “which are capable of flying in the rain and in wind gusts of up to 90 kilometres per hour.

“These are not cheap options, but they do ensure the operation is as safe as possible.”

As one would expect, NZ Drones requests NOTAMs are issued for most of its operations. This helps notify other aviators that a UAV is operating in the designated location, which potentially prevents a near miss or incursion from manned aviation.

“We do have the occasional problem with manned aircraft,” Jack says. “And frequent problems with hobby drone operators. When they first unbox their aircraft, some of them regard the rules as ‘terms and conditions’ – that is, they ignore them and just want to get the drone in the air.

“But these drones are not toys – despite being easily purchased.”

The number of drone user breaches of airspace and rules has prompted Jack to begin writing drone operation training courses. He wants NZ Drones to become a Part 141 training organisation, and through that, to become more influential in the field of aviation safety.

“There’s a lack of education. Children and teenagers, even adults, sometimes find the rules a bit difficult to understand. There’s also those people who think they can buy a drone and just go out and do commercial work and they have no idea of the rules. They fly over people without consent, they fly over property without consent, and they fly within controlled airspace without any training.”

With his PPL, Jack will become one of a small number of drone operators who are also conventional pilots.

“I think it’s good for each sector to have people who do both. It gives you insight into the things each type of pilot faces.”

What would he say to other drone operators about staying well clear of manned aircraft?

“I don’t think people flying drones, particularly as a hobby, actually understand pilot workload. They’re doing their checks and they’re listening out for other manned aircraft and they’re listening out for instructions from air traffic control. The workload is massive.

“People need to understand what that’s like for a pilot. They don’t get why pilots get so agitated by drones flying around airports and by people not doing the right thing with UAVs.

“But they need to realise it will take only one disaster to disrupt the whole drone industry.” ➤

# FLYING IN AND OUT OF GREAT BARRIER



Photo courtesy of B. Shepherd.

Great Barrier is one of the more popular destinations to fly to in the Hauraki Gulf but as a busy commercial aerodrome pilots need to be aware of the island’s unique features.

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“In the summer we are doing one flight every hour in and out of Auckland Airport to Great Barrier. As well as passengers, we take most of the freight and all the mail,” says Matt Cameron from Barrier Air.

Matt’s the company’s operations manager and chief pilot and says Great Barrier aerodrome gets extremely busy over summer with a lot of private pilots coming and going, on top of the usual commercial operators.

Matt says being aware of the circuit pattern is essential given the amount of commercial traffic coming in and out.

“Ninety percent of the pilots are pretty good and we don’t have too many issues. As long as you’ve read the AIPNZ Vol 4 plates, you understand the circuit direction and you’re making the radio calls on the correct frequency – on 124.4 MHz.”

North Shore Aero Club Chief Flying Instructor Daryl Gillett has been flying in and out of Great Barrier for the last 18 years.

His biggest observation is a lot of pilots don’t comply with standard procedures.

“One of the issues that I’ve seen over the years at Great Barrier and other aerodromes is pilots joining in any circuit direction. I’ve even seen stand-offs out there where there’s an aircraft on final for both Runway 28 and Runway 24. It’s a ‘who’s going to give way to who’ situation. If everyone was to use standard procedures and be courteous then it would all work out quite nicely.

“It appears some people have the attitude ‘I’ll just do it my way’ or ‘we’ve always done it that way’.

“Compared with an aerodrome like North Shore, there’s fewer people out there, fewer people watching, so it’s really incumbent on pilots to regulate themselves.”

## Weather

Daryl says weather can be an issue at Great Barrier.

“It gets pretty turbulent on the eastern side of the island in westerly conditions. And if you’re using Runway 28 in a westerly, you’re taking off into the terrain and into the downdrafts. It could be necessary to drift right after take-off onto the upwind side of the valley, while climbing, and fly a figure eight pattern back into the downwind position.”

He says it’s similar to operating in any mountainous environment.

“You can get quite a lot of low cloud backed up on the western or eastern side. Often the cloud will sort of sit on the tops of the highest points of the terrain.”

Dan Power is the flight ops manager at Sunair. He’s been to Great Barrier more than 500 times over the past 25 years.

Dan says prevailing winds and turbulence around the airfield are a consideration.

“Great Barrier typically has wind speed of about 10 knots higher than at the west end of the Hauraki Gulf, say around Ardmore. The prevailing wind there is a southwesterly through westerly at the airfields on the east side of the island. So, within the vicinity of the airfield you can frequently get bad turbulence.”

## Terrain

Daryl Gillett says there are very few options in the event of an engine failure, “It’s pretty hilly out there. There’s not much open ground – it’s all pretty much bush. The western side of the island is basically all rock.”

Dan Power says multi-engine operators need to consider the risks around using Runway 28 with respect to engine out performance after take-off.

“Because their ability to avoid terrain with one engine is quite compromised by the fact they’re taking off into a valley. And we as a multi-engine operator would prefer to take Runway 10 with a slight tail wind, rather than face the terrain of 28.”

Matt Cameron says the mountainous terrain can contribute to the wind.

“Given it’s an aerodrome right by the beach, on certain windy days you get a lot of wind shear up and down so a little bit of mountain flying technique comes into play.”

// **It appears some people have the attitude ‘I’ll just do it my way’ or ‘we’ve always done it that way’.** //

## Mixed use

The North Shore Aero Club does quite a few training runs out to Great Barrier, using both IFR and VFR operations.

The IFR approach into Great Barrier includes a cloud break procedure so IFR traffic comes in and out regularly.

CFI Daryl Gillett says VFR pilots just need to be aware of where the instrument approach is coming from.

“It’s basically directly from the east. The missed approach point is 2.7 NM from the aerodrome. So usually aircraft that are training or doing instrument approaches, don’t really conflict with circuit traffic. But be aware of the typical radio calls you might expect if there’s an aeroplane on the instrument approach.”

Dan Power says there’s an increasing amount of IFR traffic going in and out of there from Auckland.

“Therefore it’s important that separation can be maintained, that they comply with VFR Met minima. To have VFR traffic flying close to cloud or in poor visibility is a hazard for inbound IFR traffic.”

Barrier Air flies Caravans to Great Barrier and Matt says they come in and out at a similar speed as the Piper Aztecs flown by Sunair “but they will arrive a bit quicker”.

It’s worth noting that simultaneous operations on the seal and parallel grass are prohibited. So you can’t be backtracking while someone’s landing; you have to be clear of the whole runway.

Pilots need to be familiar with their standardisation of overhead joins and the correct radio calls.

Using the official visual reporting points will also avoid confusion for pilots unfamiliar with the area.

For more information about flying around Auckland, email [publications@caa.govt.nz](mailto:publications@caa.govt.nz) for a free copy of *In, out and around Auckland*. ☺

# WARBIRDS /// OVER ///

# WANAKA

## WHAT YOU NEED TO KNOW

By Liz Christini, Airways senior flight service specialist



A significant number of aircraft will be converging on Wanaka over the Easter period for New Zealand's biggest regular aviation event, Warbirds Over Wanaka.



### Preflight preparation and publications

There are a number of documents you need to plan a safe flight to and from Warbirds Over Wanaka:

- *AIP New Zealand*, Vol 4
- Visual navigation charts covering your proposed route and all alternative routes
- *AIP Supplement 36/20* – this covers procedures for operating in the Wanaka area from 9 to 13 April 2020
- Warbirds Over Wanaka website, “Private aircraft coming to WOW”.
- Weather information and NOTAMs.

### Getting there

#### Eastern routes

From Christchurch there are several alternates if weather is a factor. The Mackenzie Basin, Omarama, and the Lindis Pass form the most-used route, leading conveniently to the Tarras VRP. A low cloud base on the east coast might require using the Waitaki valley to get to the Lindis area, or even diverting to the south of Dunedin to access the Clutha Valley. Any diversions need careful revision of your fuel plan.

#### Western routes

From the Blenheim area, the Wairau, Buller and Inangahua/Grey valleys offer an easy scenic crossing to the West Coast. However, please note diversion choices – fuel and radio coverage are very limited south of Hokitika. The Haast Pass is a convenient entry to the Wanaka area, but before getting too far up the Haast River, check that the cloud base will let you cross the 1845 ft pass and transit the narrow valleys at a safe height. Quick tip – look carefully for the junction of the Haast and Landsborough Rivers, as here the Haast enters through a sharp turn from the south, so it's easy to miss. »





## » Air traffic services

Wanaka aerodrome flight information service, “Wanaka flight service”, will be provided when NZR998 (refer to AIP Supp 36/20 for dimensions) is not active on 120.1 MHz.

They will provide traffic information in the vicinity of Wanaka aerodrome for all aircraft, as well as co-ordinate clearances for IFR aircraft with Queenstown Approach.

An ATIS will also be in operation on 127.6 MHz. Listen to the ATIS before Tarras/Lake Dunstan, or on first contact on the ground, eg, “Wanaka flight service, Alpha Bravo Charlie, PA28 3NE Tarras commencing Tarras Arrival Alpha 1013”.

For more information on the aerodrome flight information service, check out “Parapara...um...?” in the Summer 2019/20 edition of *Vector*.

## Controlled VFR / surveillance monitoring

If you require air traffic services, check which frequencies you need during preflight checks. In flight, call as early as possible before entering controlled airspace, including your call sign, aircraft type, position report, and your intentions. Clearances are subject to traffic and there may be delays.

## Flight plans

Pilots are required to cancel their VFR flight plans filed with the National Briefing Office on 0800 626 756 (landline users only) or 03 358 1509 (mobile phone users)

or with Christchurch Information. IFR flight plans will be terminated by Wanaka flight service.

When nominating a SARTIME, add a buffer to deal with delays on arrival/departure days. Flight plans should be filed with the National Briefing Office before departure.

## Once you get there

Once pilots arrive, proceed to the designated parking areas. Itinerant aircraft parking is located by the RWY 11 threshold. Display aircraft parking is located by the RWY 29 threshold. Tarmac parking for private jets is available, but with limited spacing – contact Warbirds Over Wanaka to book your spot.

## Display practice days

Display practice will occur when NZR998 is active. Only authorised aircraft are permitted to operate. If practice times change, aircraft will be asked by Warbirds Over Wanaka display directors to remain clear until the airspace is re-opened. If unsure, listen to the ATIS on 127.6 MHz or check NOTAMs for an update on airspace and aerodrome status.

### Practice sessions are as follows:

- Thu 9 Apr 1000–1200, 1400–1700 NZST
- Fri 10 Apr 1000–1200, 1400–1600 NZST

(Note: lakefront event occurring at Roys Bay between 1630–1700 NZST Friday).



Outside these times, Wanaka aerodrome will be open to all users and flight service will be in operation.

Be aware, aircraft formations may still be practising in the Hāwea Flat/Wanaka lakefront areas, and scenic flights by a large variety of aircraft will be taking place. So a good lookout and situational awareness is key.

### Airshow days

On Saturday 11 and Sunday 12 April, Wanaka aerodrome will be closed to non-authorized aircraft from 0930 to 1630 NZST. During these times, Warbirds Over Wanaka display directors will be in operation on 118.9 MHz. They will not provide traffic information or traffic avoidance advice and will ask aircraft to remain clear. Be aware that aircraft displays will be in progress.

### See you there

Thorough preparation will enhance your flying experience. Brush up on your mountain flying skills and make contingency plans. Don't succumb to 'get-there-itis' when getting to Wanaka or flying home. Make sure you are fully briefed on weather and NOTAMs. It is recommended that you file a flight plan.

If you are filing a VFR flight plan, please remember to terminate it.

Take decisive action en route, and enjoy flying in this spectacular environment. ➡

# IT'S MORE THAN VECTOR



Thanks for letting us know your new address – we get a flurry of messages after every *Vector* mailing. But the wording of the emails clearly shows that many do not understand the legal obligations of holding a New Zealand aviation document.

Section 8 (2) of the Civil Aviation Act 1990 requires every applicant for a New Zealand aviation document to supply an 'address for service' in New Zealand including, where applicable, telephone and facsimile numbers.

The Act also requires aviation document holders to notify the Director promptly of any changes to the address for service, telephone number or facsimile number. You can do this using the online form under "Contact us" on the CAA website, [aviation.govt.nz](http://aviation.govt.nz), or by emailing [info@caa.govt.nz](mailto:info@caa.govt.nz).

An address for service is a physical address. You can have mail sent to a different address if you like, but maintaining a current physical address for service with the CAA is a legal requirement under the Act. This applies to both individuals and organisations, whether based in New Zealand or overseas. The requirement is specified on relevant application forms.

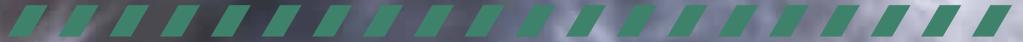
If you live overseas, or plan to relocate overseas, you must nominate a physical address in New Zealand. This could be the address of a lawyer, a family member, or an aviation organisation. In doing so, you accept that delivery to that address is formal notification for the purposes of the Civil Aviation Act 1990.

If you use a separate postal address, that can be a New Zealand address or an overseas address, but be aware that *Vector* magazine is sent only to New Zealand postal addresses.

Applicants under the Trans Tasman Mutual Recognition Act also need to comply with the Civil Aviation Act 1990, and the relevant forms (24061/09 and 24061/10) reflect this.

You also need to advise other organisations that you do business with, of your change of address. If you subscribe to *AIP New Zealand*, for example, you need to contact Aeropath, [shop.aeropath.aero](http://shop.aeropath.aero). If you operate an aircraft with a 406 MHz distress beacon, you must notify RCCNZ, [beacons.org.nz](http://beacons.org.nz), of any changes to your contact details. ➡

# A WARNING ON DRUG TESTING FOR OPERATORS



An operator was anguished after discovering that several employees deliberately set out to deceive him by trying to stymie a drug test. The employees had purchased ‘synthetic urine’ off the internet, and from a local retailer.

The operator had conducted random drug testing since 2012, and in this particular location, had had only one 'non-negative' result in that time.

But last year, a laboratory found numerous instances of synthetic urine from the one testing session.

"We have a number of staff who're NZQA-qualified to undertake drug testing," says the operator. "One of them tested a single sample which turned out negative for the presence of a drug, but the tester questioned the temperature of that sample, as it was cooler than expected.

"So he took a second sample from the same employee, which was also clear. But still questioning the temperature of that first sample, he sent it off to a laboratory. The lab finding was that the first sample was, in fact, synthetic material.

"So we hit everyone at that location with a test, and sent all the samples to the lab where more synthetic urine was identified.

"The team leader who carried out the original testing was devastated. There was a real sense of betrayal. It was worse than if we'd been made aware of non-negative findings. This was so calculated."

The fallout of an accident involving an employee with the presence of a drug in their system is not lost on the operator.

"There'd be the trauma, shock and guilt triggered by an accident. Then the reputational damage to our company, and to the industry in general, would be enormous.

"The staff members involved would find themselves in a terrible legal disciplinary situation of their own making, and unsupported by us."

The operator says he's been told a lab test will always pick up if a urine sample is synthetic.

"The employees had been told the sample would pass muster. It was all 'chemically balanced' to perfectly mimic natural urine. But it was a lie. They were naïve and it caught them out."

The operator says it's unnervingly easy to purchase the synthetic material.

"I went online and searched 'synthetic urine for sale NZ' and it was disturbing how much was for sale. One of our staff even bought it from a retailer just down the road.

"You can even buy artificial genitalia so if a staff member has to produce the sample in the presence of the tester – which our employees do not have to do – the employee can carry the deception even further."

## // A lab test will always pick up if a urine sample is synthetic. //

The operator's message to other operators?

"If there's any level of suspicion whatsoever, make sure the urine sample goes to the lab, even if you're using external drug testers. Tell those external drug testers you want the sample to go to a lab.

"When this all came about, we engaged a professional drug detection company, and they admitted even their tests cannot identify synthetic urine.

"So any doubts at all, insist on it being sent to the lab."

After the three samples were found to be synthetic material, the operator held an all-staff meeting.

"We tabled what had happened, we told them what we would be doing in the future about drug testing, and that there'd be zero tolerance for such deception.

"For a while after this incident, we sent every test off to the lab, but it all comes at a cost, so we now send a random selection, at random times.

"Tell your staff what you're doing; what your drug testing regime will be, and how lab tests will always pick up synthetic material.

"Hopefully that will stop you experiencing the same distress as us.

"It made us feel so naïve that this was happening under our noses, and we were unaware of it."

CAA Flight Operations Inspector Mac McCarthy commends the operator on how they responded to the incident.

"Every operator needs to know that something like this could happen to them. So it's also to the credit of this operator that they reported it to the CAA, and kept us in the loop.

"That meant we could share it with the wider aviation community." ➔

# THE INS AND OUTS OF HAMILTON

Pilots flying in and out of Hamilton aerodrome need to know it's a busy piece of airspace, with a lot of training traffic. It's also a relatively small control zone which means things can happen pretty quickly.



Greg Hagarty, the CFI at Hamilton's flight training school L3Harris Airline Academy, says people need to appreciate the volume of traffic operating at and around Hamilton.

"In terms of movement numbers, it's second only to Auckland, which operates more hours of the day than us. The training areas around Hamilton are very busy."

That means pilots must be well prepared and study the arrival and departure procedures in AIPNZ Vol 4 thoroughly before flying to Hamilton.

"The arrival procedures require thorough study before coming in. Don't underestimate the procedures," Greg says.

He says the entry and exit points from the zone means traffic tends to concentrate at either Cambridge in the east or west around Temple View.

"They're nice, easy points to pinpoint your location as you're coming in and out of the zone and the arrival procedures reference these points. Arrival briefings should be completed in good time to allow pilots to concentrate on looking out and listening out. If you are not immediately given clearance into the zone, you may find yourself holding clear with a number of other aircraft."

Tim Bradding, the chief controller at Hamilton Tower says the other factor is that there's a lot of training aircraft.

"They're all working as hard as they can to do the right thing, but it is a training environment, so errors do get made. The aerodrome is busy and also prone to people doing the unexpected," Tim says.

That means they have very standardised procedures.

"The key thing for us as controllers is that people are well briefed on those procedures before they come to Hamilton.

"It's very likely that they will get those published procedures when they arrive rather than just plain language clearance."

Tim encourages any pilots who are uncertain about anything, to make a phone call to the tower.

"We would really recommend that they give us a call and have a chat about it."

He says they also encourage pilots to tell them if it's their first time flying into Hamilton when they first call up on the radio.

"So that we can be aware of that, and just give them a little bit more space and time to get themselves sorted."

Tim says if pilots have a good understanding before they come to Hamilton aerodrome, it will make their lives a lot easier in the busy airspace.

Peter Wilson, the CFI at Waikato Aviation, agrees.

He's been flying in and out of Hamilton for 15 years and says if you're a first-timer, you must read the arrival and departure procedures thoroughly before coming to Hamilton.

He says situational awareness, keeping a good lookout, and maintaining an active listening watch are all essential.

"Have an idea where traffic is in the area, because there are some quite high density points for arrival and departure and a lot of training traffic in the area."

Peter says people should also be aware of Te Kowhai aerodrome on the north-western side of Hamilton aerodrome.

"There's quite a few light sport aircraft that operate out of and around and south of Te Kowhai."

## Radio traffic

Greg Hagarty says the radio traffic can be very busy.

"Remember to push the PTT (push to talk) before you start to talk and do not rush your radio call. Speak clearly and at the correct pace. Rushing your radio calls often leads to having to repeat the call or the readback. Clarify with ATC if you have any uncertainty about what to do; they are there to help you."

He says some arriving and departing traffic may be operating on the Tower frequency, while other traffic may be on the CFZ frequency.

"It's that juggling act departing the zone and calling clear on Tower frequency as you enter the CFZ, which is right up to the edge of the control zone. Our guidance has always been that when you're within close proximity of the control zone, you should be on the Tower frequency so that as you depart you have awareness of joining traffic and as you return to the aerodrome you have awareness of departing traffic. That does potentially put you out of comms with people on the CFZ frequency who may be transiting close to the CTR without talking to ATC. This is where two com boxes can be of benefit but it does require intelligent management. Regardless of anything else, do not let use of radio distract you from maintaining a good lookout."

Peter Wilson says you have to stay on top of the radio.

"Especially from your initial call prior to entry to the arrival reporting points at Mystery Creek or Rukuhia. »

» “Getting that call in, you have to be active on the radio. You also need to know where to hold if you can’t get that radio call in.

“Keep an active listening watch and know the visual reporting points.”

Tim from the Hamilton Tower says it’s critical pilots are aware they’ll have to change frequencies.

“The initial call will be made on 122.9 MHz and that’s a controller who will give them their clearance into the airspace.

“Then prior to entering the airspace, they change to 126.8 MHz and that’s the controller who’s actually controlling all the traffic within the control zone.

“They must make that frequency change, otherwise they won’t receive any instructions as to what’s going on.”

Tim says the RT in Hamilton is extremely busy with clearance limits in each part of the procedure.

“We need people to be very aware of what those clearance limits are, and not to break them if they can’t get in on the RT.”

He says there are specific procedures if you can’t get in on the RT.

“And that’s to hold at certain points. So the key message is – if you can’t make a call, make sure you know what you should be doing next.

“We often have occurrences where people who can’t get a call in on the RT will just continue on flying and join the circuit – these are often pilots who come from uncontrolled aerodromes.”

Tim says another thing they see quite often is itinerant pilots joining into the downwind and then turning onto a very short base leg without making a radio call.

“That’s a dangerous position to put yourself in because the circuit’s so busy that we’ve got traffic on both sides of the circuit pattern. And if they make a turn into the base leg without having made a radio call and having received a sequence from us, chances are they’ll be turning directly towards traffic coming on the opposite base leg.”

He says in that situation a pilot should keep extending downwind until they can make a call to the Tower or the controller can call them and give them instructions. ➤

## AS IF YOU NEEDED IT, THERE’S ANOTHER REASON TO STAY OUT OF MILITARY AIRSPACE. DRONES.

The NZDF is increasingly concerned about near misses between its drones and manned aircraft.

General aviation aircraft shouldn’t be in active military operating areas anyway. But sometimes they unwittingly or carelessly ‘wander through the gate’. Now, aside from the risks posed by weapons firing, demolition exercises, and low-level aerobatic training, civil pilots also need to be aware of possible military drone activity.

The New Zealand Defence Force is increasingly testing and using drones – both commercial and military – and has more than 200 qualified drone operators.

“Drones are a proven lifesaving capability for NZDF,” says Hayden Robinson, the army’s experimentation manager.

“It’s genuinely a game changer. Our personnel can conduct reconnaissance tasks and find adversaries without putting themselves in harm’s way.

“Our work has also highlighted a range of additional tasks where UAS<sup>1</sup> can be valuable. They include security tasks at camps and bases, surveying, search and rescue, firefighting, and delivery of small logistic packages such as water or first aid kits.”

Hayden says the NZDF has developed procedures for the safe and professional use of drones, with a certification process and many of its airworthiness rules and policies mirroring those of the CAA.

Squadron Leader Don Richardson from RNZAF Flight Safety says “All our UAS-trained personnel are taught the CAA rules, and also to be familiar with the idiosyncrasies of the Defence Force airworthiness system.”

<sup>1</sup> Drones are also referred to as remotely piloted aircraft systems, RPAS; unmanned aerial vehicles, UAVs; unmanned aerial systems, UAS; and UA, unmanned aircraft.



Photos courtesy of NZDF.

// A soldier from 16th Field Regiment, Royal New Zealand Artillery prepares the Puma UAS for flight during a training course at Makomako, near Pahiatua.

While that means the Defence Force has its safety ducks in a row, manned aircraft breaching military operating airspace can, in one itinerant meander, put ‘people and property’ at lethal risk.

“Typically our UAS operations are conducted within our military operating areas (MOA) such as the Waiouru military training area and various danger areas,” says Don.

“In late 2018, MOA were also permanently established over Linton Military Camp in the Manawatu and Burnham Military Camp near Christchurch.

“These MOA enable us to conduct UAS operations at heights above 400 feet AGL, by day or night, and beyond visual line-of-sight.

“Sometimes we conduct exercises outside of our camps, bases and training areas. When that happens we operate under Part 101 rules.

“We will often promulgate temporary MOAs by way of AIP Supplement.”

Despite the precautions, in the past 12 months, there’ve been five near-miss occurrences between manned aircraft and military-operated drones in MOAs, and in danger areas made active by NOTAM.

That worries the NZDF because it’s planning to make more and more use of drones.

“We’re buying many more of them,” says Don, “from small, short-range, hand-launched systems to larger, long-range systems with sophisticated sensors.

“Among other activities, we hope they will help us patrol the vast areas of our maritime domain.”

Don says drones will continue to help the Defence Force be more effective and efficient.

“And it’s our intent to continue to be responsible and professional airspace users, who operate safely.

“But we also need the help of the civil aviation community in respecting military operating area boundaries, and checking NOTAMs for, and remaining clear of, activated danger areas.” ≡



// The Puma UAS being launched by hand as part of a military training exercise.

# ROOT CAUSE ANALYSIS – THE FIVE WHYS

After an occurrence, some operators ‘fix’ what they see as the most obvious cause of a failure. And they’re perplexed when the failure happens again, because they ‘fixed’ it, didn’t they? But the real cause could be buried deep inside the operation, ready to trigger another unpleasant surprise.



Let’s say a pilot of a small cargo operation has an occurrence. The internal investigation finds pilot error to be the cause and the pilot receives extra training.

Then another pilot in the same operation does something similar. There’s obviously something going on other than pilots making decisions that led to occurrences.

An investigation that asked ‘why’ the first pilot made the decision they did might have found they were fatigued. Asking why they were fatigued might have found they were overworked. Asking why they were overworked may have found there was a seasonal influx of work and too few pilots to meet the demand.

And asking why that had happened may have identified poor personnel management practices at the operation – employing just the adequate number of pilots to meet the requirements of low season work, but not employing extra personnel to cover high season needs.

Diving deep like this into the possible cause of an occurrence is called root cause analysis and the method described here is called the five whys.

It’s used by CAA’s safety investigators.

“We ask, ‘is it training that caused this?’” says CAA Safety Investigator Colin Grounsell, “Or is it the ergonomics of the aircraft – have the manufacturers made the landing gear selector handle look similar to the flap lever and have them in close proximity to each other?”

“Could it be poor maintenance practice, or is the maintenance manual deficient?”

“Or is it the way the company is organised?”

Fellow CAA Safety Investigator Dan Foley says it’s easy to blame human error.

“Blame is the enemy of safety,” he says. “Phrases like ‘he ought’, ‘she should’ – those are ‘blame words’ and using them often veils the true cause of an issue.

“They’re part of a faulty set of conclusions called ‘hindsight bias’. This prejudice arises when someone not involved in an incident looks at all the factors involved laid out in front of them and thinks, ‘well it’s obvious to me what happened; they should have seen it too’.

“Whereas, when you’re in the decision-making environment itself and things are unfolding and you cannot necessarily see what is going to happen next, all the factors that led to the occurrence are not obvious at all,” says Dan.

“It’s very rare that a pilot or engineer does something deliberately foolish. So you have to put yourself in their position and think, ‘right, they were flying along, or in the workshop, and they made these decisions and those decisions made sense to them at the time.

“Now why is that’, why didn’t they do the things that seem so obvious to us?”

Colin Grounsell says most organisations do a good job of investigating an occurrence.

“But what can be really difficult is when the investigation leads you down into the culture of the organisation. It’s like throwing rocks inside your own glasshouse, and may not be taken very well.

“So you can understand internal investigators’ reluctance to start asking the harder questions of the CEO.”

But Dan Foley says the real value comes from asking those difficult questions.

“It’s a mark of the organisation’s maturity – and its resourcing – to be able to do it. But an organisation will sometimes struggle if one or two people are wearing multiple hats. In that situation, contracting an outside investigator can be a good move.”

Colin says the ‘five’ in five whys should not be taken literally.

“You could go on to 11 whys if needed. Or you might find the cause in three.”

An Australian quality system consultant, Mike Sondalini, says at each stage of the five whys, investigators must have concrete evidence that they’re on the right track.

“[Otherwise] they end up fixing problems that did not cause the failure incident ... it is never certain that you have found the root cause unless there is real evidence to confirm it.”<sup>1</sup>

He says if physical evidence is truly impossible to get, clear logic can also be used to map the path from cause to occurrence.

“Impeccable logic that withstands scientific scrutiny can also be used to identify the failure path,” he says.

“It is evidence and clear logic that decides the path to take, not someone’s opinion.”

Dan Foley says if some issue along the way is found to have contributed to the incident, even if it isn’t the root cause, identifying it gives an opportunity to fix it.

“Let’s say someone slips in a pool of water. That’s traced to a leaking air conditioner. That’s tracked back to a seal that’s been faulty for some time, and the ‘why’ of the long-term faulty seal leads back to a poor reporting culture.”

“While the poor reporting culture is the root cause of the incident, identifying the faulty seal clearly gives the opportunity to fix it.”

An internal investigation also needs to question why its safety management system didn’t identify the potential risk, or if it had, why the risk escalated to a fully formed occurrence.

“Following an investigation,” says CAA Safety Management System Specialist Charlotte Brogan, “operators should review their risk controls to ensure those they’ve documented and have in place actually worked.

“Or if the controls they had in place weren’t effective in stopping the occurrence happening, operators should look at what controls will be effective.

“And if the occurrence was something unrecognised as a potential risk, it now needs to be captured within the risk register.”

Colin Grounsell says anyone struggling with an internal investigation can contact the Safety Investigation Unit at the CAA and ask for help.

“We’re happy to help, and it’s free of charge,” he says. ➡

<sup>1</sup> Web article: *Understanding How to Use The 5-Whys for Root Cause Analysis*, Lifetime Reliability Solutions.

### Five whys analysis example

```

graph TD
    A[Caught speeding] -- Why? --> B[Late for work]
    B -- Why? --> C[Got up late]
    C -- Why? --> D[Alarm clock didn't work]
    D -- Why? --> E[Dead batteries]
    E -- Why? --> F[Root cause: Forgot to replace them]
    F --> G[Remedy: Get a plug-in alarm clock or replace the clock's batteries at set times before they run out.]
    
```

By repeatedly asking the question "Why?" you can peel away the layers of an issue and get to the root cause of a problem. Keep asking "Why"? until you reach an actionable level.

Chart courtesy of Impac.

### // OCCURRENCE INVESTIGATION WORKSHOP

Colin and Dan are presenting a new CAA workshop on occurrence investigation.

See the back cover for dates and places where the workshop will be held.

Email [publications@caa.govt.nz](mailto:publications@caa.govt.nz) for your free copy of the updated booklet, *How to report occurrences*.

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# WITH AERODROME SAFETY, **SIZE DOESN'T MATTER**

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‘Private aerodrome’ conjures up a simple strip and little activity. Some, however, are quite complex and increasingly busy. Pilots who don’t plan their flights properly and barrel through the circuit areas of these aerodromes put everyone in danger. *Vector* spoke to three aerodrome owners in Canterbury because their issues reflect the national picture.



// The three vectors of Forest Field aerodrome.

Ces and Pam Collings established Forest Field Aerodrome – 10 NM northwest of Christchurch Airport – in 1989. Its standard circuit altitude and procedures lent themselves to flight training, and from the start, Ces and Pam gave local flight training organisations access to their airfield.

Since then, Forest Field has grown into quite a complex aerodrome. Ten aircraft are based there, and there are a number of houses on site.

“There are also three runways,” says Pam. “With six potential circuit patterns there can be aircraft anywhere within the vicinity of the aerodrome, ie, a two NM radius.”

Over the years the number of aircraft flying in the area has increased; some of that due to airspace changes altering traffic flow patterns.

Training aircraft fly between Christchurch Airport and the western training areas, and there are numerous north-south transiting aircraft each day.

At an airfield elevation of 400 feet, the circuit traffic at Forest Field is at 1400 feet and joining altitude is 1900 feet.

“That’s a slim margin of 100 feet between joining height and the lower limit of the control area, and as a result, we’ve had some close calls,” says Pam. “Especially lately.”

The problem is nationwide. According to latest figures from CAA’s analysts, reported unauthorised airspace incursions at unattended aerodromes more than doubled from 14 in 2017, to 32 in 2019. Analyst Charlotte Rose says this cannot be explained by increased activity.

“During the same two year period, activity has remained relatively stable,” she says.

“The raw data indicates the causes are often a failure to read the charts, and check NOTAMs.”

“Increasingly, transiting pilots are flying through at 1500 ft,” says Pam. “I suspect that sometimes they’re using Forest Field as a waypoint. But this puts them in direct conflict with any circuit traffic.”

“It isn’t hard to avoid the area,” pleads Pam to itinerant pilots, “so please do it.”

## Frequency issues

Aircraft approaching from Christchurch, or from the north, change from the Canterbury CFZ frequency, 120.0 MHz, very close to Forest Field (119.2 MHz).

“So there’s not much time for making calls or hearing calls from circuit traffic,” says Pam, “before being in the airfield area.”

“Even making a radio call does not absolve a pilot from maintaining situational awareness because we have quite a bit of NORDO aircraft round here.

“It’s possible some pilots think there won’t be any traffic: often Forest Field is quiet, but other times it’s quite busy. You don’t know if and when there’ll be activity, or if and when there’ll be NORDO traffic in the vicinity.”

## The wrong frequency

Russell Brodie of Rangitata Island, 15 NM from Timaru, used to have regular problems with pilots flying overhead his aerodrome, even cutting the circuit areas.

“About 15 years ago, we got our aerodrome published in the AIP Vol 4, and that’s made a big difference.”

Nevertheless, Russell says, there are still some aircraft completely oblivious to the presence of a privately owned aerodrome directly beneath them.

“Clearly they don’t consult the charts,” says Russell. “Or their charts are hopelessly out of date.”

“It’s the same with radio frequencies. Before publication in the AIP, we’d been on the Timaru frequency. Then for a short time after publication we went to 119.1 MHz. It was pretty quickly realised that wasn’t going to work because we’re so close to Timaru. So for many years now we’ve been back on the Timaru frequency of 119.5.

“But, even now, some pilots make calls on 119.1.

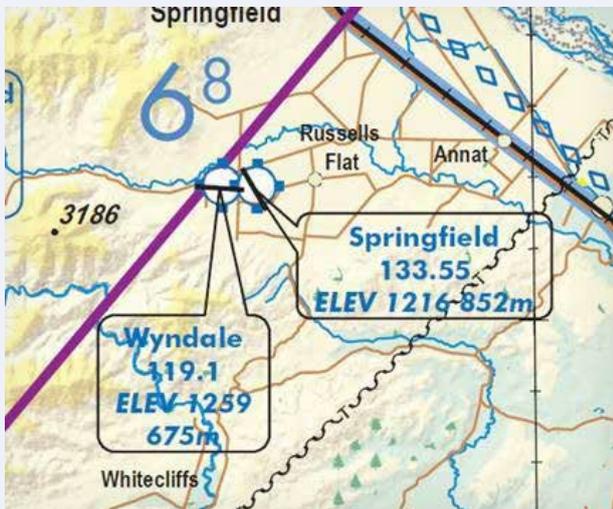
“What does it take for pilots to realise what frequency you’re on after all this time?” he asks.

Like Forest Field, Rangitata Island can be a very busy place. It has two vectors, extensive NORDO microlight activity and standard join training. »



Photo courtesy of Russell Brodie.

// Rangitata Island can be busier than Timaru aerodrome some days.



// If there are two aerodromes close together, Aeropath says it will slightly overlap them to reduce chart clutter.

» It's home to the Geraldine Flying Group, and several heritage aircraft collections.

"The irony is that, despite some pilots being totally fixated on Timaru and oblivious to our presence, some days it can be quiet in Timaru, and really busy here."

### Read the blinkin' chart...

Russell says some pilots get south of Christchurch and think it's all 'open skies' after that.

"Blissfully unaware, they can track clean through our circuit.

"It's simple enough – just read the blinkin' chart."

While Russell encourages pilots to do 'proper' flight planning, he also says the owners of private aerodromes should announce their presence in the AIP Vol 4. (When an aerodrome is listed in Vol 4, it also appears on the relevant chart when it's next published.)

"How else are pilots to know you're there? While we still have aircraft coming through at circuit height, the numbers have greatly reduced since we've been on the charts.

"There are a few private aerodromes around here which have problems with transiting aircraft and I say to the owners, 'why don't you get the strip published?' and they say, 'oh, it'll cost too much and it's too much of a hassle'.

"But it's in their interests to be on the charts – it lowers the risk of them being run down."

### ...particularly you transient pilots!

Keith Vallance's Fernside Fields – which neighbours another private aerodrome, Barradale, is just 1.8 NM from the Rangiora aerodrome.

Although Fernside Fields is published in Vol 4, Keith says his main concern is pilots arriving at the aerodrome, not having – surprise surprise – read the AIP nor the chart.

"They circuit incorrectly to the south side of the airfield, conflicting with the Barradale circuit. Or they take off on 06, turning right and overflying Barradale to the south-east." [↗](#)

## // THERE ARE A NUMBER OF BENEFITS IN HAVING YOUR AERODROME PUBLISHED IN THE AIPNZ VOL 4.

Apart from letting pilots know you exist and where:

- it gives you the ability to file a flight plan to and from the aerodrome, and get a flight following service.
- it gives you the ability to request the issue of a NOTAM for, say, a temporary closure.
- it provides pilots with your location should they need to land quickly in an emergency, or precautionary landing situation.

Requests for submissions can be made to [info@aeropath.aero](mailto:info@aeropath.aero).

The process of having your aerodrome or heliport noted in the AIP and on the relevant chart is free of charge.

Your only responsibilities as the owner/operator are to arrange NOTAMs when needed, and to contact Aeropath for amendments to your AIP listing if any details change, eg, runway length, contact phone number.

To check if your proposed aerodrome needs a 'determination' by the Director of Civil Aviation, check rule 157.1. This work is charged out at the CAA's standard hourly rate.

Contact [aeronauticalservices@caa.govt.nz](mailto:aeronauticalservices@caa.govt.nz).

### By the way

According to rule 101.205, the operator of a drone cannot fly their aircraft within 4 km of an aerodrome unless the owner/operator of that aerodrome agrees.

That has Aeropath busy as increasing numbers of private aerodrome operators apply to have their site listed in Vol 4, to have more control over drones flying over or near their property.



## // REGISTER YOUR ELT AND KEEP IT UP-TO-DATE

It's simple; register your ELT beacon before installation. Then update the details if anything changes, such as a change of owner.

This greatly increases your chances of being found if in distress, and prevents wasted search effort.

Before start-up, and before shut-down, check 121.5 MHz for any false activations.



## AVIATION SAFETY ADVISORS

Contact our aviation safety advisors for information and advice. They regularly travel the country to keep in touch with the aviation community.

**John Keyzer** – Maintenance, North Island  
027 213 0507 / john.keyzer@caa.govt.nz

**Carlton Campbell** – South Island  
027 242 9673 / carlton.campbell@caa.govt.nz

**Neil Comyns** – Maintenance, South Island  
027 285 2022 / neil.comyns@caa.govt.nz

## HOW TO GET AVIATION PUBLICATIONS

### AIP New Zealand

AIP New Zealand is available free from [www.aip.net.nz](http://www.aip.net.nz). Printed copies of Vols 1 to 4 and all aeronautical charts can be purchased from Aeropath on 0800 500 045, or [shop.aeropath.aero](http://shop.aeropath.aero).

### 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 website. 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 [aero@caa.govt.nz](mailto:aero@caa.govt.nz).

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

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

For more info, visit [aviation.govt.nz](http://aviation.govt.nz) > Safety > Airshows.

CAA cut-off date	Aeropath cut-off date	Effective date
11 Mar 2020	18 Mar 2020	21 May 2020
08 Apr 2020	15 Apr 2020	18 Jun 2020
06 May 2020	13 May 2020	16 Jul 2020
03 Jun 2020	10 Jun 2020	13 Aug 2020

Visit [aviation.govt.nz/aip](http://aviation.govt.nz/aip) to view the AIP cut-off dates for 2020.

## REPORT SAFETY AND SECURITY CONCERNS

Available office hours (voicemail after hours)

**0508 4 SAFETY** (0508 472 338)

[isi@caa.govt.nz](mailto: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)

[aviation.govt.nz/report](http://aviation.govt.nz/report)

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

# ACCIDENT BRIEFS

## Titan T51 Mustang

Date and time:	18-Oct-2016 at 11:13
Location:	Matamata
POB:	1
Injuries:	1 fatal
Damage:	Substantial
Nature of flight:	Private other
Pilot licence:	Commercial pilot licence (A)
Age:	80 yrs
Flying hours (total):	5085
Flying hours (on type):	100
Last 90 days:	1

On the day of the accident the pilot intended to carry out a local flight. During take-off, an engine power loss occurred at approximately 250 feet AGL. The aircraft was observed to descend steeply and strike the ground approximately 40 metres off the end of the runway.

The aircraft was a three-quarter scale replica aircraft, which had been built from a kitset by a team of aircraft engineers with assistance from the pilot. The pilot had chosen to fit a Mazda 13B Renesis rotary engine to the aircraft. This was the only known example with this engine installation.

The pilot had carried out unsupervised maintenance on the No 2 Engine Control Unit when he had the fuel schedule map modified. This may have accounted for the loss of engine performance and subsequent total engine power loss.

When the aircraft struck the ground, the shoulder harness failed to restrain the pilot's upper body, allowing him to strike the instrument panel and control stick, resulting in fatal injuries. The positioning of the pilot's shoulder harness attachment to the pilot's seat frame caused the seat frame to fail.

The CAA safety investigation determined that the accident forces involved when the aircraft struck the ground were within the range considered survivable for human tolerance.

First responders to the aircraft had difficulty opening the cockpit canopy to gain access to the pilot. The pilot had incorporated a modification to the aircraft and had installed internal canopy locks which could not be accessed externally.

The CAA issued a Continuing Airworthiness Notice (CAN) 25-001 Titan Aircraft Company T-51D Mustang – Seat Belt Attachment in September 2017. The CAN advises owners of the recommended shoulder harness attachment location.

Following a recommendation by the CAA to the Titan Aircraft Company, the company has agreed to publish a T-51 advisory notice. The notice will advise that the use of the top rail on

More accident briefs can be seen on the CAA website, [aviation.govt.nz](http://aviation.govt.nz), Safety > Aircraft accident briefs. Some accidents are investigated by the Transport Accident Investigation Commission, [www.taic.org.nz](http://www.taic.org.nz).

the pilot seat back for the mounting of the shoulder harness is not recommended. At the time of completing the CAA safety investigation report, the publishing of the Titan Aircraft Company advisory notice had not been completed.

A full report is on the CAA website.

[CAA Occurrence Ref 16/5545](#)

## Montgerie Bensen B8MR

Date and time:	09-Apr-2017 at 14:41
Location:	Pio Pio
POB:	1
Injuries:	1 fatal
Damage:	Destroyed
Nature of flight:	Private other
Age:	25 yrs
Flying hours (total):	50
Flying hours (on type):	25
Last 90 days:	0

The pilot flew his privately owned Montgerie Bensen B8MR gyroplane for a local flight. It was a sunny day with minimal cloud and light winds. The gyroplane was witnessed conducting a series of low-level manoeuvres before suddenly losing height and impacting terrain. The pilot did not survive.

The accident likely occurred when sufficient relative airflow through the rotor disc was not maintained. This led to a rapid loss of lift, rotor aerodynamic stall, and loss of control.

The investigation identified the following key factors contributed to the accident:

1. The inexperienced pilot was conducting flying manoeuvres outside of his capability, and well below the prescribed minimum safe heights.
2. A handling error by the pilot most likely led to a rotor stall and loss of lift. The nature or cause of the error could not be conclusively established.
3. Depression and/or medication may have adversely affected the pilot's fitness to fly.
4. The Montgerie Bensen B8MR gyroplane is more difficult to fly than modern gyroplane designs, especially for inexperienced pilots.
5. The pilot had limited interaction with the aviation community.

A full report is on the CAA website.

[CAA Occurrence Ref 17/1785](#)

# GA DEFECTS

## KEY TO ABBREVIATIONS:

**AD** = Airworthiness directive    **NDT** = non-destructive testing  
**TIS** = time in service                **TSI** = time since installation

**P/N** = part number                    **SB** = Service bulletin  
**TSO** = time since overhaul        **TTIS** = total time in service

### Guimbal Cabri G2

#### No 2 cylinder

<b>Part manufacturer:</b>	Lycoming
<b>Part number:</b>	LW13870
<b>ATA chapter:</b>	7200
<b>TTIS hours:</b>	2190.9

A ticking noise was heard on departure, so the pilots returned to the helipad. Just before landing the noise became worse. The helicopter lost power and a smell of burning fibreglass was noticed. On inspection, an apparent burn hole in the fan shroud was visible.

The maintenance investigation found that the No 2 cylinder was cracked around the inlet valve seat area. The engine was removed for overhaul.

The maintenance provider advised that Continuing Airworthiness Notice (CAN) 85-009 Lycoming Parallel Valve Cylinder Assemblies was being followed. The cylinders on the Cabri were difficult to inspect, however. Regular compression checks were being carried out.

The engine was operating on extension up to 2400 hours. It had accrued 2190.9 hours.

Following this occurrence, the CAA amended DCA/LYC/224 Lycoming Parallel Valve Cylinder and Head Assemblies – Inspection to incorporate the recommended inspection requirements of CAN 85-009. This made the cylinder inspection mandatory for every 50 hours of operation until the cylinders are replaced. DCA/LYC/224A effective 28/02/2019 refers.

[CAA Occurrence Ref 18/8300](#)

### TRI-R KIS TR-4 Cruiser

#### Latching mechanism

<b>ATA chapter:</b>	5210
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One of the aircraft's gull-wing doors opened suddenly in flight and broke off the aircraft. The aircraft landed safely.

The pilot advised the aircraft was in smooth air and in a normal descent profile at the time, and that there was no warning before the door opened.

Inquiries found that this issue has occurred many times, internationally, on that type of aircraft. Many owners have modified their door latch systems in numerous ways to mitigate this issue.

[CAA Occurrence Ref 18/6602](#)

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 website, [aviation.govt.nz](http://aviation.govt.nz), Aircraft > GA defect reports.

### Pacific Aerospace Cresco 08-600

#### Propeller governor

<b>ATA chapter:</b>	6100
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During flight the pilot noticed a major oil leak from around the engine cowls. The maintenance investigation determined the source of the oil leak was from the propeller governor. Although the extent of the leak made it difficult to determine its source, it's considered that the shaft of the speed control lever was most likely.

The propeller governor was replaced the day before the incident due to unstable max propeller RPM. The replacement propeller governor had zero hours since overhaul, and at the time of the incident, it had been in service for approximately 20 minutes.

The propeller governor was replaced in the field and the oil tank replenished, with four quarts of turbine oil added. The removed propeller governor was returned to the overhaul facility for warranty investigation and repair. The aircraft was returned to service with no further oil leaks.

As the governor overhaul facility was located in Australia, CAA notified CASA of the defect for their information and for any possible follow-up action.

[CAA Occurrence Ref 18/6687](#)

### Hughes 369D

#### Turbine assembly

<b>Part model:</b>	C20B
<b>Part manufacturer:</b>	Extex
<b>Part number:</b>	E23031938
<b>ATA chapter:</b>	7200
<b>TSI hours:</b>	1414.2
<b>TTIS hours:</b>	3187.65

During take-off, the pilot heard two loud bangs accompanied by yaw. The pilot aborted the take-off and off-loaded the passengers. Due to the unstable terrain and forecast poor weather, the pilot departed the glacier to fly to the hangar. After take-off, the pilot noted that power was adequate, but the turbine outlet temperature was unusually high.

The engineering investigation found that the No 2 nozzle guide vane bellows failed. Damage to the hot section was present, and the turbine caused binding after shutdown.

The affected components were replaced, and damaged components were sent for examination or repair.

[CAA Occurrence Ref 18/6369](#)

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