

Pointing to safer aviation

The special issue 2023

vector

YOUR FAMILY
DOESN'T WANT TO...

...HAVE TO MEET US



A MESSAGE FROM THE DIRECTOR



Our safety investigators examine the scenes of fatal aircraft accidents and try to find out what has contributed to them.

They do this, so others can learn from these tragedies.

This special issue of *Vector* contains their stories, as well as their advice on avoiding the quite common factors in many fatal accidents.

They're doing this, because, fundamentally, they don't want to have to visit your family. Yes, it's their job, but it's never easy.

Among the most common reasons they've had to visit a bereaved family are a lack of flight planning (including getting the weather), VFR into IMC, over-reliance on tech, or a generally careless attitude to flying within the rules.

This special edition of *Vector* also has stories about people in our aviation community making great decisions – like diverting instead of heading on into weather.

I'm hoping you'll read this special issue of our magazine, and honour the memory of those who've died in aviation accidents, by taking on board the safety messages it contains.

Our safety investigators do an amazing job for New Zealand aviation safety. Here at the CAA, we're taking a closer look at how we can enhance our investigation management systems, procedures, and practices to do an even better job of supporting aviation safety. This will include looking at how we address risks, occurrences, incidents, and accidents so we too can learn, and ensure our regulatory systems are as effective as they can be.

Keith Manch

Director of Civil Aviation



HE MAIMAI AROHA A TRIBUTE TO OUR LOVED ONES

He kura tangihia, He maimai aroha

Kimihia rangahaua

Kei whea koutou ka ngaro nei!

Tēnā kua riro ki Paerau

Ki te huihuinga o te kahurangi ka oti atu koutou e!

Tangihia te whatumanawa, Hotuhotu ake te manawa

Nei rā te rau wharawhara o te aroha, e pātukituki te ngākau a tangata

Auē taukiri e

Seek, seek

Where are you who are missing?

You have gone beyond Paerau

To the gathering of our loved ones

The seat of emotions cry and the heart sobs

For you of no return



From left to right:

David Oliver – holds ATPL(H). Flying 19 years. With the CAA since 2017, initially as a flight operations inspector, the last three as a safety investigator.

Siobhan Mandich – holds CPL(H) and C-cat instructor rating. Flying 14 years. With the CAA for 10 years, eight of those as a safety investigator. Nine fatal accident investigations.

Peter Stevenson-Wright – holds a PPL, flying for more than 40 years, and a safety investigator for 26 years. More than 30 fatal accident investigations.

Colin Grounsell – holds a CPL, B-cat instructor rating, MEIR, and flight engineer licence. Flying 43 years. Holds ratings on almost 30 types of aircraft. Fifteen fatal accident investigations over 16 years with CAA.

Sam Stephenson – holds an ATPL(A), AMEL/IA. Twenty-seven years flying taildraggers to widebody jets. With the CAA for three years after five years with TAIC. Fourteen fatal accident investigations.

Kate Cook – holds a CPL(A) and C-cat instructor rating. Psychology and aviation management graduate, with a special interest in human factors. Five years a CAA safety investigator.

Steve Walker – twenty-eight years an investigator. Holds a post-graduate diploma in air accident investigation. Is a LAME(H) and has worked for Air New Zealand and TAIC. Has been in charge of 25 fatal accident investigations with the CAA and TAIC. Current focus on engineering issues arising in service.

Lou Child – ATPL(A). B-cat instructor, GA, regional airlines and captain B737-800. Safety investigator for 10 years with both CAA and TAIC.

Dan Foley – flying and instructing for 23 years, turboprops, domestic and international calibration pilot. Sixteen years at the CAA, currently leads safety investigation team.



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// STUCK IN THE MIDDLE WITH YOU



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// PATTERNS OF RULE-BREAKING



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// MIKE'S STORY

Cover: The CAA's safety investigators. They investigate about 400 reported occurrences, including about seven fatal accidents, each year. Each of those tragedies leaves its mark on them. They really don't want to have to visit your family and say that your family really doesn't want a visit from them.

Photo: CAA/David Hamilton
See our cover story on page 14.



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// YOUR FAMILY DOESN'T WANT TO HAVE TO MEET US

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LETTERS TO VECTOR

Reader comments and contributions on aviation safety are welcome. Let us know your thoughts by emailing education@caa.govt.nz. We'll try to publish a selection in each edition, although they may be edited or shortened.

We'll only publish ideas and observations contributing towards safer aviation.

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WHO'S REALLY FLYING YOUR AIRCRAFT?

A conversation with three safety investigators about the downfalls of trusting technology too much in the cockpit. »

WARNING:
PIST HEAT MUST BE ON WHEN
OPERATING BELOW 40° F IN INSTRUMENT
METEOROLOGICAL CONDITIONS.

WINTERIZATION KIT MUST BE REMOVED
WHEN OUTSIDE AIR TEMPERATURE
IS ABOVE 20° F



» Heavy reliance on technology in the cockpit has been a topic discussed at length in the aviation community over the past few years.

The messaging from us has remained the same – technology is there to help the pilot, not replace them.

But errors resulting from blindly trusting technology continue to contribute to accidents and incidents.

Experienced CAA safety investigators Sam Stephenson, Siobhan Mandich, and Colin Grounsell give *Vector* their insights into how pilots can use technology to make flying safer – without losing sight of who’s really flying the aircraft.

What’s the problem?

Colin: One way to look at this issue is that, more and more, pilots are trusting technology to fly their aircraft safely, instead of using their own learned skills.

We see people feeling confident enough that they take a ‘back seat’, while still sitting up front in the cockpit.

Sam: Another aspect is that many of these aircraft aren’t certified to fly in cloud. When CFIT accidents occur, what we’re often seeing are VFR pilots who aren’t qualified to fly under IFR, and they’re using the avionics equipment to enable them to fly in conditions which aren’t suitable.

I guess it gives them some comfort that they’ve got a couple of EFIS displays showing them terrain, and there’s an autopilot to fly the aircraft.

They can become overconfident and a bit less risk-averse, and can put themselves in situations they probably shouldn’t be in.

Colin: That’s right, and then it’s their autopilot that quite literally flies them into the side of a hill.

Siobhan: I remember investigating an accident relating to this issue, that we touched on in the article “Not drowning in the tech” in the Spring 2021 issue of *Vector*.

It involved a VFR pilot who had AvPlan installed on their iPad®, but unfortunately they were using that technology with the warning systems turned off.

In addition, they didn’t do thorough flight planning, so they were relying on the technology to do the basic stuff they should’ve done before leaving. They ended up choosing to fly into fog – which they weren’t legally

allowed to do – and didn’t realise there was a hill in between themselves and their destination.

Unfortunately, some VFR pilots get to that point where they use the technology in lieu of doing the required training, and getting the appropriate qualifications to be able to fly IFR. They feel like they can install this equipment into their aircraft – even though it’s not certified to be used for IFR – and still get the job done.

Colin: I think it becomes more of a problem when they perhaps upgrade the aircraft type they’re flying. Or they modernise the aircraft, or their next aircraft has a flight management system. They feel like all they have to do is input a route of Paraparaumu to Napier, for instance, and that automatically calculates the line on the map, and that’s it.

They can hop in the aeroplane and just fly, and they lose situational awareness of that flight track.

Whereas when you do your planning on a map, you would look five or ten miles on either side of that track, and look for the highest ground and any hazards that might be present along the way.

What are some of the reasons VFR pilots might choose this approach?

Siobhan: I think VFR pilots sometimes feel time and money are both barriers to gaining the qualifications needed to fly IFR.

Sam: Additionally, what are they going to do with that qualification if their aircraft isn’t certified for IFR? Even if the pilot has got themselves qualified, they can’t actually use their aircraft in cloud. That’s probably the biggest hurdle – most of these pilots would probably have to replace their aircraft and that’s expensive.

However, the equipment that can be retrofitted to certified aircraft is more accessible these days.

Siobhan: As I mentioned earlier, even if they’ve got all this equipment but they’re ignoring or disabling the warnings – like terrain for example, because they fly around low level a lot and are sick of getting all the warnings – they’re going to get into trouble.



// We see people feeling confident enough that they take a 'back seat', while still sitting up front in the cockpit. //

Photo: CAA/David Hamilton

// Safety investigators (from left) Sam Stephenson, Siobhan Mandich, and Colin Grounell talked to Vector about the role over-reliance on cockpit technology has played in accidents they've investigated.

What are some of the drawbacks of the technology?

Colin: People can jump into an aircraft and just say, 'Well, let's head direct to wherever we want to go.' But they're relying on this tech to warn them when there's terrain coming up, or airspace ahead, which can change.

Something pilots need to be aware of is that they have to regularly update their airspace database, otherwise the information could be wrong, which could result in an airspace incursion.

Sam: That's something the IFR pilot or the owner has to do on a regular basis every 28 days – update their navigation databases. It's not as often for VFR flying, but those pilots still need to be aware of airspace changes.

Colin: One issue is that because this equipment isn't certified, there's no guarantee the database is 100 percent correct. An example of this is the ZK-SML fatal accident published on the CAA website.

Sam: That's right, it's important for pilots to know what they're going to do if their tech fails. Sometimes screens can turn off, power supplies fail, or the equipment can give incorrect information, so it's good to have a Plan B.

What advice do you have for pilots using technology in their aircraft?

Colin: I guess what it comes down to is pilots sticking to the rules. The rules are the minimum standard they should operate to, and hopefully they actually go further than what the rule requires. If pilots did that, we wouldn't have people flying into hills, and getting into trouble in bad weather. The rules are there to keep pilots safe, and if they did stick by them, then we wouldn't see half the accidents that we do, as far as flying into terrain is concerned. So it's a matter of pilots understanding that.

Sam: If you keep within the limitations of the equipment and pilot qualifications, then you shouldn't get yourself into this sort of situation in the first place.

Siobhan: There's absolutely a time and place for technology. It's just remembering that it's also important to do proper flight planning, alongside using the technology appropriately. ➤

STUCK IN THE MIDDLE WITH YOU

Understanding the weather between your departure and destination points is an important step in your flight planning.

In 2018, an Alpi Aviation Srl Pioneer 300 crashed in the Taringatura Hills in Southland, after entering fog at low level. The accident was established as controlled flight into terrain (CFIT).

In 2019, a Tecnam P2002 Sierra RG also had a CFIT accident, in the lee side of the Tararua Range, after being caught in downdraughts.

The original plan was to operate Paraparaumu to Foxpine, but at some point the crew made an inflight decision to fly to Flat Point on the east coast.

They had only the Straits area forecast package, which indicated strong north-westerly winds of 20-30 knots above 1000 feet, and the NZ Graphical SIGMET Monitor diagram, which indicated turbulence in the Wairarapa.

The report noted it was a sunny day in the Wairarapa and that the crew would probably be able to see through the Tararua Range beneath the cloud base.

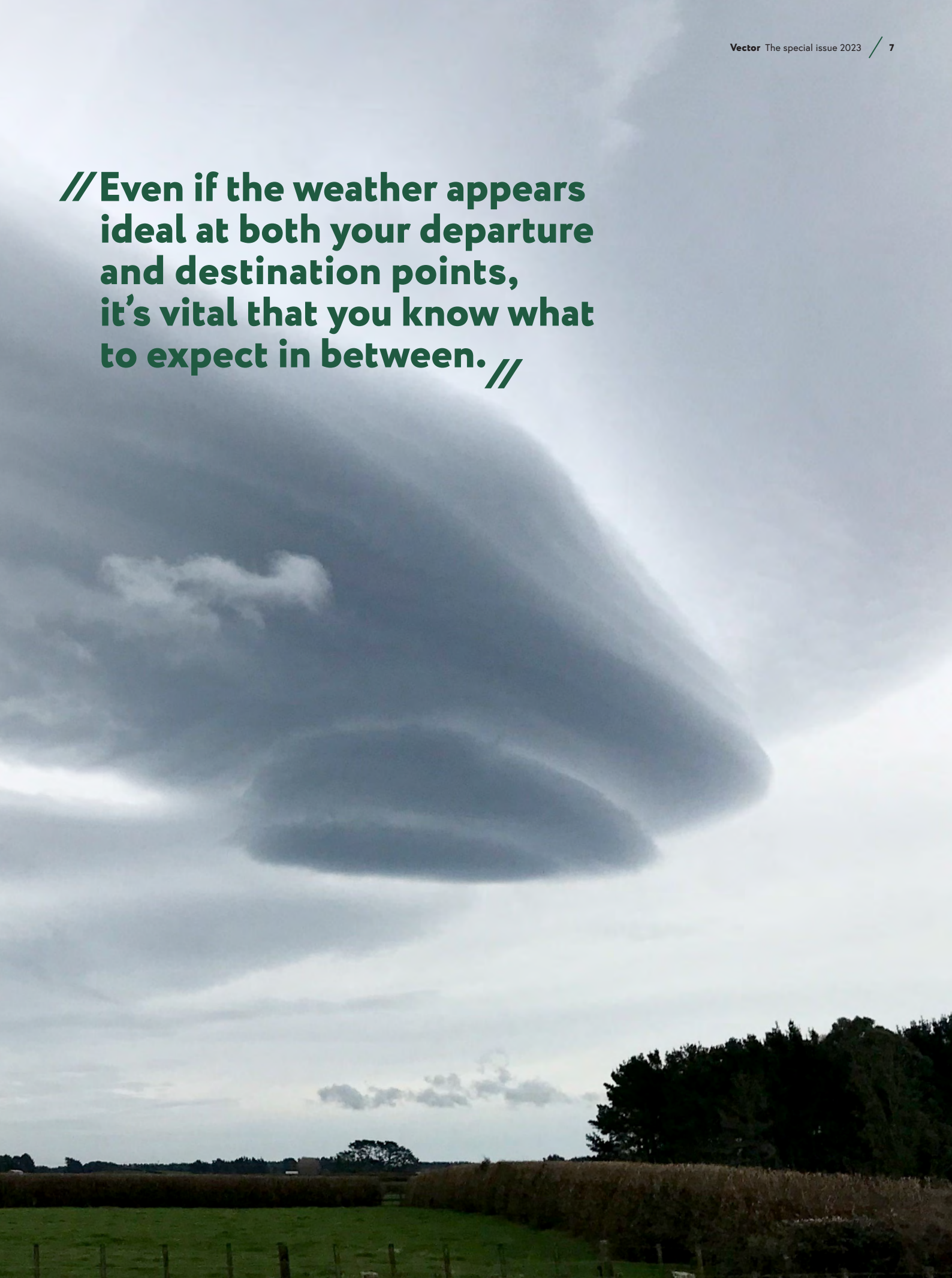
Unfortunately, one of the causes of this accident were that the crew didn't appear to consider the significance of the conditions in the lee of the Tararua Range, given the forecast winds' velocity that day. Nor did they obtain the latest available weather information for the new route. Even if the weather appears ideal at both your departure and destination points, it's vital that you know what to expect in between.

In this article, CAA Chief Meteorological Officer Paula Acethorp, MetService Meteorologist Ashlee Parkes, CAA Safety Investigator Peter Stevenson-Wright, and a regulatory investigator, Jason Frost-Evans, provide some insights.

We'll also look at one of the newer certificated tools to help you plan safe and enjoyable flights. »

// A lenticular cloud. Usually formed downwind of a physical protuberance (Mt Taranaki in this case). There are usually strong wind gradients and turbulence in the lee.

**// Even if the weather appears
ideal at both your departure
and destination points,
it's vital that you know what
to expect in between. //**



» The value of weather experts

MetService Meteorologist Ashlee Parkes explains why their advice is the best.

“Meteorologists who work in the aviation section at MetService are tested every three years to ensure they are competent with the products and workflow, given the safety-critical nature of aviation forecasting. A high-level technical understanding of the atmosphere, climate, and weather models is required.”

It’s clear that creating accurate forecasts for New Zealand’s aviation community is no small task. Ashlee describes the weather models she uses in her job, and how they work.

“At MetService we use three global weather models. We take these and run models of a high resolution, 8km and 4km, across Aotearoa New Zealand.

“Unfortunately, these models don’t perfectly represent reality, and this difference is most apparent across Aotearoa’s mountainous regions.

“The weather is heavily influenced by the local terrain. Winds channel through valleys, fog forms more regularly in basins, and the uplift of air over mountains causes cloud formation.

“If the models can’t perfectly represent the mountainous geography of the land, how do we expect them to perfectly predict the weather?

“This is where having a qualified meteorologist analyse the models shines. We analyse the models, compare them with real-time observations, and use our knowledge about the terrain and local effects to compile a forecast.”

Paula Acethorp agrees. “MetService’s Graphical New Zealand Significant Weather (represented in MET documents as ‘GNZSIGWX’) and Graphical Aviation Forecast (GRAFOR) charts are the only aviation-specific products giving you the expected en-route conditions in New Zealand, to support effective preflight planning.”

Jason Frost-Evans says there are “plenty of colourful apps and platforms which are a great indication of the risk of your washing not drying.



“But don’t trust them to indicate the ceiling, inflight visibility, or conditions that are hazardous to aviation, such as icing or hail.

“They’re just not designed for that purpose.”

PreFlight – the weather app doing it all

While there are plenty of free weather apps out there, using a Part 174-certificated supplier gives pilots the assurance that a qualified meteorologist has produced the forecast, and that the underlying systems are supported by a safety management system.

PreFlight provides the same aeronautical information you’d find on a VNC, along with meteorological information, airspace advisories, briefings, and aerodrome information, including NOTAMs.

“It’s never been easier to check NOTAMs or get the latest weather,” says Safety Investigator Peter Stevenson-Wright, “as well as review a lot of other information before you get in an aircraft.

“As a safety investigator of more than 20 years, I hope I’ll never see another occurrence involving a pilot not checking the weather, or their NOTAMs, before a flight.

“PreFlight makes it easier to satisfy the requirements of rule 91.217 *Preflight action*.

“Pilots, ask yourself this,” questions Peter. “Is my life worth 180 seconds?” That’s about how long it takes to select and request weather information and NOTAMs in PreFlight.”

// Checking the weather is part of thorough preflight planning. Here, Wellington Aero Club's Pete Mitchell literally maps out a flight from the capital to St Arnaud and Nelson.

"I was taught early on in my cross-country training to spend the same time on preflight planning as I expected to be in the air. I've since become more efficient, but I still always set aside a fair amount of time on the ground, to reduce workload and surprises in the air!"

Paula agrees. "Rule 91.301 VFR meteorological minima tasks pilots with making sure VFR minima can be complied with along the route. But most model-based weather apps can't provide cloud base or visibility forecasts.

"The GNZSIGWX and GRAFOR charts are both available to pilots

through the PreFlight website. In fact, PreFlight is free for recreational pilots – so there's no reason for them to not have all the right information.

"Pilots should also familiarise themselves with the times forecasts are issued, so they can make sure they have the most up-to-date information before take-off.

"Some local-scale weather is a bit trickier to forecast, and it's often not until a day out that it becomes clear that thunderstorms are likely that afternoon, or fog will form that night."

"If you find that the conditions aren't what you expected," says Jason, "then don't forget that FISCOM (flight information service communication) is available in most places, or you can talk to ATC. Ask them for the latest report for your destination or nearby airports, and consider making a PIREP (pilot report) so other pilots are aware.

"Remember, if the weather has an impact on the safety of the operation, you should file a 005 report, especially if MET minima are breached.

"That way, if there are trends, the CAA and MetService can work together to improve the service."

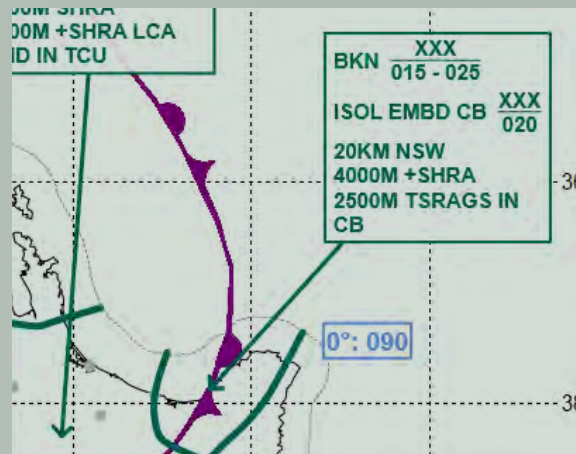
Just wing it? Yeah, nah

The CAA says the days of 'winging it' are gone. We now have readily available resources to ensure that weather doesn't ruin your flight. Your passengers and family will expect you to keep yourself and anyone in your care safe, so be professional, and use the best and most appropriate resources available for every flight you're planning. ✈️

Decoding the GRAFOR

What are the meteorologists telling you here? It's worth reminding yourself that this is a snapshot in time, with validity +/-3hrs, so that's potentially a lot of information to convey!

Let's focus on the eastern Bay of Plenty – and firstly, look at the cloud group. The meteorologist is expecting prevailing cloud conditions of broken cloud (5-7 eighths of the sky covered), with bases between 1500ft to 2500ft above ground level.



Source: MetService

The tops of those clouds are above the vertical limit covered by the GRAFOR – extending to at least 10,000ft and depicted by XXX. Separate to that cloud, there will be isolated cumulonimbus (CB) clouds, with a base of around 2000ft, tops beyond 10,000ft.

The next few lines describe the weather that can be expected. 'NSW' means 'nil significant weather', so *mostly* there won't be any weather of concern.

But as the front passes through that region, the weather is expected to deteriorate for a time with heavy showers of rain (+SHRA). This will reduce the visibility to 4000m, and with those isolated CB connected to the front, the visibility could reduce further to 2500m in thunderstorms, rain and small hail (TSRAGS).

The TAF (terminal aerodrome forecast) equivalent would be a 'TEMPO' of poorer weather for a time with the passage of the front. In this example, it would be a good idea to also check the Whakatane TAF to get a feeling for the speed of the passage of the front through the region, along with any observation that might be available.

PUSHING THE BOUNDARIES OF SAFETY

Here are some personal stories of knowing when to say ‘no’ to risking that little bit of bad weather.

We’ve all been there. The plans have been in place for weeks, and people are relying on you to be at a certain place at a certain time.

The weather on the day is looking a bit rough, but an experienced pilot can easily navigate that, because the most important thing is to get there on time...right?

Sadly, this approach to toughing out inclement weather often results in CAA safety investigators seeing similar accident scenes time and time again.

It’s what sends them to your family, with the difficult job of trying to explain what happened in the air that day.

CAA Safety Investigator Lou Child points out that a common theme to these accidents is a lack of preflight weather planning for the entire route.

“When they encounter deteriorating weather, some pilots seemed determined to push on, often well below VFR MET minima. When the flight also continues below VFR minimum safe heights, things really start to stack up against them.

“Flying below VFR minimum heights in reduced visibility means the pilot has less time and fewer options to turn around or avoid terrain and obstacles.”

However, things don’t have to work out that way. With some thorough flight planning, and a little bit of flexibility

to adapt your plans when needed, you can get to where you need to be – alive and well.

Here are some personal stories from New Zealand aviators about when weather woes have disrupted their well-laid plans, and how they responded to keep themselves and others safe.



Mark Woodhouse Waypoints Aviation

Mark is the joint owner of Waypoints Aviation. He’s an experienced ATPL ground instructor, and an Air New Zealand pilot recently retired from flying the Boeing 787-9 Dreamliner.

Here, Mark reflects on a situation when someone he was coaching chose to be flexible and adapt to the weather conditions, rather than push the boundaries of safety.

“Some time ago, I was gearing up to carry out a flight test for a PPL candidate. They had only a narrow window of time to complete the test, because they were soon heading out of town for an extended period.

“We’d scheduled a time for the test, but when the day came, the weather wasn’t ideal. In fact, I’d say it would’ve been entirely unsuitable.

“I didn’t want to pressure the candidate, or prompt a decision from them, so I sat on my hands and waited to hear from them. To the candidate’s credit, they contacted me and asked if we could delay the test.

“Interestingly, the candidate confessed they’d been worried that we (myself and their instructor) would think less of them for delaying the test. Of course, I supported the decision they’d come to of their own volition.

“What I didn’t tell them was that if the test had gone ahead in the inclement weather, I was almost certain that it wouldn’t have been successful.”

Mark admits that making ‘no go’ or ‘turn back’ decisions can be difficult when a pilot first starts out, but feels this does become easier with practice.

“I’ve always felt that flying instructors would do well to take their students out in marginal conditions, to demonstrate the true application of such decision-making.”



Paul Holland Kāpiti Districts Aero Club

Paul is a former flying student with Kāpiti Districts Aero Club. Here, he describes a dual cross-

country training session in a Piper Tomahawk PA-38 with instructor Diego Acevedo, where the weather unexpectedly deteriorated and forced some quick thinking and a change in plans.

“After preflight and ground planning, we departed Paraparaumu en route to Palmerston North, Whanganui, and then back to Paraparaumu.

“The weather was overcast at 3000 feet, with the forecast indicating the cloud should be lifting and clearing.

“We made it to Palmerston North at 1500ft with no problem, just a slight deviation to skirt around a little bit of lower cloud.

“We stopped there briefly, dipped the tanks to confirm fuel burn, and re-checked the weather – which still indicated the cloud should be lifting.

“Palmerston North to Whanganui was uneventful, and the sun was out when we landed. We stopped briefly at Whanganui, before flying south along the coast back to Paraparaumu.

“After about 10 minutes, the cloud ahead was looking a lot lower than what was forecast. We continued south, but the cloud ceiling was coming down, the further we went, forcing us to descend.

“It appeared as if the cloud was down to sea level, although it was hard to determine.

“Throughout this time, Diego was talking to me about the conditions, and asking my opinion on the best course of action.

“At around 1000ft, with the cloud in front looking like it was impassable, I told Diego I would like to turn back toward Whanganui to wait it out, and see if the cloud lifted.

“Diego agreed, and we turned back. We also had radio comms with another Kāpiti aircraft which was tracking north on the other side of the same cloud bank, and had also turned back.

“Once on track back to Whanganui, we discussed our options and decided we would track back along our original route past Palmerston North, and home to Paraparaumu.

“We called air traffic services, advised them of the change to our flight plan, and tracked toward Fordell, then the VRP of Marton Reservoir, and on to Palmerston North.

“As we approached Feilding, we were again forced by low cloud to descend, and started to get into some light showers. We continued at approximately 1000ft, and deviated to head between some areas of rain.

“About five minutes past Feilding, it became apparent that the same low cloud stopping us heading down the coast was now inland. Forward visibility was reducing, and we agreed we were unlikely to be able to get home. So, we turned back and landed at Feilding.

“We parked up, got a ride into the Feilding town centre, and went to a cafe to get some lunch. We rang the aero club at Kāpiti to let them know where we were, and they mentioned the cloud had come right down there, so we wouldn’t have been able to land VFR even if we had made it back.

“One of the other instructors offered to fly IFR to pick us up from Palmerston North, so we headed back to the Feilding airfield to make our way to Palmerston North.

“The cloud base was low, but we only needed to get up to 1500ft to fly the VFR approach into Palmerston North. From the ground it looked like we would be able to get up to that altitude, so we took off.

“As we climbed out on the crosswind leg, we started to get close to cloud at approximately 600ft. We immediately stopped climbing, completed a low circuit, and landed again at Feilding.

“From 600ft, we couldn’t even see Palmerston North – which is only about 4NM away. »

» “We went back to the Feilding town centre and someone from the club ended up driving 90 minutes to pick us up. The plane was recovered a couple of days later.

“I’m grateful I was with an instructor during my first weather diversion. Diego allowed me to fly and make decisions, but it was good for me to discuss what I was seeing, and have his experience to learn from.

“For me, the lesson from this was that forecasts aren’t always accurate. According to MetFlight, the cloud should have been clearing, not getting worse, so constant situational awareness in the aircraft is vital.”



Ross Millichamp AOPA NZ

Ross is the vice-president of the Aircraft Owners and Pilots Association New Zealand. Here, he

shares an experience where he made a wise decision to stay safe in deteriorating weather conditions.

“Private aircraft operators encounter more than their fair share of weather issues. We often travel far from home and for extended periods of time, with little confidence about the likely weather on the return journey.

“We also have no aero club supervision or office safety management system support. In short, we tend to be on our own up there.

“I regularly travel to the North Island from our home base near Darfield, and find the Cook Strait area to be where I encounter most weather problems.

“On a recent trip to Whanganui, the pre-departure weather reports suggested good conditions most of the way, with the lowest cloud base – 1200 feet – predicted to be around the Kāpiti coast.

“Once airborne, I checked conditions at Wellington and Paraparaumu using MetFlight.

“Overhead Kekerengu, I called Wellington Approach to request radar monitoring across the Strait, and for a more personal assessment of the weather on the far side.

“They reported that Wellington was fine and clear, and offered to call the Paraparaumu Flight Information Service for an up-to-date report there. Wellington Approach got back to me a short time later to report the cloud base at Paraparaumu was now down to 1000 feet.

“Midway across the Strait, Wellington Approach called again to advise the cloud had lowered to 800 feet at Paraparaumu, and asked what my intentions were.



“The problem with tracking close to the south Wellington coast in northerly conditions is that it’s bumpy.” – Ross Millichamp.

“One aspect of crossing the Strait from Cape Campbell to Ōhau Point is that you can’t see the weather on the Kāpiti coast until you’re almost there.

“I advised that I’d take a look around the corner and report back. As I approached Ōhau Point, Wellington Approach once again interrupted their calls to airline traffic to ask if I ‘could see the North Island?’ I was getting the idea that they were a little worried.

“The reality of the situation was that both Wellington Approach and I knew what the weather was doing in Wellington and at Paraparaumu, but had no idea of what lay between.

“I advised that I could, indeed, see the North Island, and was close to being able to see up the west coast. As I came around Ōhau Point, I was confronted with the sight of cloud down to sea level and no prospect of continuing to Whanganui.

“I’d been tracking slightly out to sea, and had the space to make a reverse turn with land in sight at all times. Once I was heading back south, I called Wellington Approach and advised that I’d abandoned my attempt to reach Whanganui and would track along the coast towards Wellington while I decided what to do next.

“The weather over the Strait had started to deteriorate as a northerly front pushed through, and although it would probably be possible to reach Marlborough, I was running out of enthusiasm for grovelling around over the water in deteriorating weather.



“On any long-distance flight, I usually print out the AIP charts for airfields that I might need to divert to.

“This time, one airfield I’d neglected to consider was Wellington. It has the reputation of being busy, and in my experience, it almost always has the worst weather in the area. I looked down at the hefty AIP Vol 4 on the floor of the aircraft, and considered trying to find the VFR arrival procedures among the 20-odd pages dedicated to operating in and out of Wellington.

“The problem with tracking close to the south Wellington coast in northerly conditions is that it’s bumpy. Trying to find the right page in the AIP, or trying to access it on a touchscreen tablet in rough conditions, with no passengers to help, would have been an exercise in futility.

“Instead, I threw myself on the mercy of Wellington Approach and asked “Can you talk me through an arrival into Wellington? I have no idea what the arrival procedures are, and don’t fancy trying to find them in the AIP in these conditions.”

“Ten minutes later, I was clearing the taxiway onto the western apron at Wellington Airport, and called the tower to thank them for their assistance.

“I was expecting, however, to hear the dreaded words ‘Juliet Bravo Tango, please call the tower on completion’, a sure sign that I’d done something wrong.

“Instead, they graciously acknowledged my thanks, and simply suggested that I talk to an instructor at the Wellington Aero Club for a departure briefing before my next flight.”

Aviate – navigate – communicate

Ross says at the end of the day, don’t let the weather get the best of you.

“Looking back on the day, I realise that no matter how well you prepare for a flight, and no matter how much technology you have available in the cockpit, New Zealand’s changeable weather will always hold the trump card.

“And when the weather does turn against you, follow the old adage of aviate first, then navigate, and finally communicate.

“And if everything goes wrong, ask for help!” 🍷

// FOR MORE INFORMATION

Accident reports

You can read accident reports that illustrate the theme of this article by going to aviation.govt.nz/safety-reporting > **fatal accident reports**. Relevant reports include ZK-TNB, ZK-LSV, ZK-ING, ZK-CMV, and ZK-COM.

Vector articles

The following past *Vector* articles provide more information on this topic. You can read these, and other past articles, by going to aviation.govt.nz/vector.

Autumn 2022

The value of preparedness

Spring 2020

Flight planning – not a quick once-over

Summer 2019/20

What is your life worth?

May/June 2017

So you don’t think you need a NOTAM?

GAP booklets

The following GAP booklets provide more information on this topic. You can read these by going to aviation.govt.nz/education.





YOUR FAMILY DOESN'T WANT TO HAVE TO MEET US

It's never 'just a job' for our safety investigators to have to meet a family bereaved by an aviation tragedy.

The CAA safety investigation team investigates about 400 reported occurrences a year. These could be things like a precautionary landing due to engine failure, or Avgas igniting during fuelling.

But about seven of those occurrences, each year, are fatal accidents.

Each of those accidents, in some way, leaves its mark on them.





Tying a silk rose

Safety Investigator Lou Child says families are often, understandably, hesitant to visit a crash site.

“One of the things I do,” she says, “is tie a white silk rose to the accident site to mark it for them. I’ll take a photo so they can see where it happened.

“It’s my way of respecting those who lost their lives and their loved ones left behind.”

Sometimes Lou will discover a connection with the family that makes the tragedy stand out even further in her memory.

“In one case, I placed a rose on a nikau palm. In this instance, the pilot’s partner did visit the site. Afterwards, she hugged me, crying, and said, ‘Do you know that was my partner’s favourite type of tree?’

“Coincidentally, the nikau palm is my favourite also,” says Lou.

“Moments like those stay with you.” »

// One of the things I do is tie a white silk rose to the accident site to mark it for them. I’ll take a photo so they can see where it happened. //

» **“Those heart-wrenching moments”**

For the team, each investigation is more than just an examination of the facts. They know that how they approach their work will impact on the wellbeing of families and individuals.

“I think most people assume the hardest part of our job is going to accident sites,” says Safety Investigator Kate Cook.

“When I started, I presumed that would be the hardest part of the job, but it’s actually not.

“It’s those heart-wrenching moments when you meet the bereaved family, and witness their raw emotion in trying to process what’s happened.

“I went to one interview with a big family, and while a couple of them were openly distressed, the rest were just numb.

“You could see the enormity of what had happened hadn’t really hit yet. I also knew that after we’d talked with them, and left, it would really hit home.”

Kate says it’s not just grieving the pilot that occupies the family – there’s also a myriad of practical things to deal with.

“In one accident I went to, the pilot was the breadwinner. Not only was his wife traumatised by the fact he was gone, the uncertainty about her financial future was really playing on her mind.”

“I could see my son in him”

Dan Foley, the safety investigation team leader, says he’ll carry some of the tragedies he’s had to investigate, forever.

“It may sound harsh, but the deceased pilot doesn’t experience the aftermath of suffering. Their wife or husband and their kids suffer so much – especially the children.”

Dan talks about one fatality that occurred in a paddock next to the pilot’s home. The family were the first responders to the scene.

“The following day we were able to complete our scene examination, at which point the family asked if they could come and lay some flowers at the site. We always make every effort to cooperate with requests like that, and clean up the accident site as much as possible.”

As the group approached, the investigators stepped back to give the family privacy to mourn.

// I’m sure your kids and your wife are lovely but I don’t want to meet them... and you certainly don’t want them to meet me. //

But Dan noticed a young boy was part of the grieving group. “The reason I’ll never forget this, is because he was about the same age as my son.

“Witnessing a child go through such trauma is entirely different to observing adults coping with loss.

“I put myself in the position of the deceased father. As the poor child gently laid the flowers down, tears streaming down his face, at that moment, I could see my son in him.

“It was a very difficult sight to process. It happened to be a sunny day, and I was grateful for my sunglasses. They provided some cover for my own tears.”

Dan recalls another accident that pushed him to the limits of his emotional resilience.

“There was one that I really struggled with. The passenger in the back seat had been recording the entire journey on a camera. Little did they know that this footage would later become part of the accident investigation.”

At the moment of impact, the camera was flung from their grasp, the lens was damaged, but it continued recording audio of the passenger in the front seat – the sole survivor of the crash.

“As part of the investigation, I had to watch and listen to this exceptionally graphic recording, all 45 minutes of it.

“It continued all the way through to the first responders arriving.

“Having the conversation with the family about the events that had unfolded was very difficult.”

Dan has met a few survivors of fatal accidents. Each has had a profound impact on him.



“The mates or passengers who survive often suffer severe trauma. They can end up physically disabled, but are also psychologically scarred as they process their memories of the accident.”

Meeting survivors has given Dan more insight into the human face of tragedy.

“I regularly think of the people I’ve met, some not really being able to walk, or those who were in the midst of starting families.”

“I often wonder how they’re getting on now, and if they’ve been able to piece their lives back together.”

We’re worried about your flying

While each bereaved family’s experience is unique and deeply personal, for Lou Child it seems like there’s a common feature – “those flipping lilies”.

“When we walk into the house of a grieving family, amidst the sympathy cards and baking, there seem to always be the lilies. It’s a smell I always associate with tragedy.”

Sometimes, however, Lou says, a pilot does hear the safety message, and avoids the ‘lilies’.

She once had a frank conversation with a pilot who was appearing regularly in reported airspace occurrences.

Lou recounts the conversation.

“Do you mind me being a bit blunt with you?” Lou asked him. “That’s fine,” the pilot responded.

“Look,” she said, “you’ve just told me the reason you pushed to get to your destination, despite the weather, is because you didn’t want to divert, and inconvenience your children. They’d have to drive an hour to collect you and then back again.”

“Yes, that’s correct.”

“I can guarantee you, 100 percent, your kids would rather do that and be inconvenienced, than have police officers calling at the door.

“I’m sure your kids and your wife are lovely but I don’t want to meet them... and you certainly don’t want them to meet me.

“I’m only being this blunt with you because, while part of my job is focussed on safety education and prevention, investigating fatal accidents is the other side of my work.”

This pilot grasped the gravity of the message. He took on Lou’s message, undertook extra training and he hasn’t featured in airspace occurrences since. ➡



// STOP AND THINK

Everyone reading this article will have a different family situation, but something we all have in common is being affected by the death of someone we’ve known.

The effect of a passing doesn’t stop with family. It often ripples through friends, friends of friends, workplaces, and through communities.

The investigators present you with a challenge – stop and take a moment to think about, not *your* life, but the lives of those you love.

What would life be like for them, after you pushed the weather to save a couple of hours, or failed to do a complete preflight plan to save a couple of minutes?

Guaranteed, 100 percent, it would not be as good as it is now.

For help in dealing with grief or trauma, go to our back cover.

PROACTIVE MAINTENANCE AND INCIDENT REPORTING

Photo: iStock.com/vm

Incidents are free lessons, but to get their maximum benefit, we need your reports.

CAA Safety Investigator Steve Walker, a specialist in examining aircraft maintenance occurrences, says his recent work has had him being the fence at the top of the cliff, rather than the ambulance at the bottom.

“I often liken the process of investigation to assembling a jigsaw puzzle. In the aftermath of an accident, you’re trying to describe what the jigsaw puzzle looks like, often with only some of the pieces. However, incident reports allow us to continually refine and build a more comprehensive picture.

“And incident reporting allows us to be more proactive, which, in turn, helps prevent further mishaps,” says Steve.

Steve is dedicated to working with organisations to improve their maintenance systems, and culture. He encourages safety managers of large – and small – operations to be transparent about their findings.

“While you might be reluctant to report certain information about safety performance to the CAA, your reports allow us to help you identify system weaknesses. It also means we can pass on critical safety information to other participants.”

A number of recent continuing airworthiness notices (CANs) can be directly attributed to industry reporting.

“In one example, a CAO05 report detailed the deterioration of rear spar bolts on Fletcher wing attachments.

“These had been worn beyond working tolerances. That was because the sealant covering the bolts was preventing a maintainer inspecting them properly during scheduled maintenance.”

Collaboration between the CAA and maintainer meant a CAN was issued, alerting other workshops to the problem that a thick layer of sealant could prevent detecting excessive bolt wear.

Avoiding pilot maintenance accidents

“There are legitimate means by which pilots can carry out certain maintenance tasks, provided some conditions are met,” says Safety Investigator Sam Stephenson.


Those conditions are outlined in rule 43.51 *Persons to perform maintenance*.

“But those who are authorised, or are working on their aircraft under a maintenance approval, aren’t always getting the help they need and involving the experts.”

Sam refers to a fatal microlight accident where a design change modification – a change of propeller type, carried out by the owner – wasn’t notified to the CAA.

“The new propeller type wasn’t on the engine manufacturer’s approved list for installation. Tragically, the propeller detached during flight, resulting in a fatality.

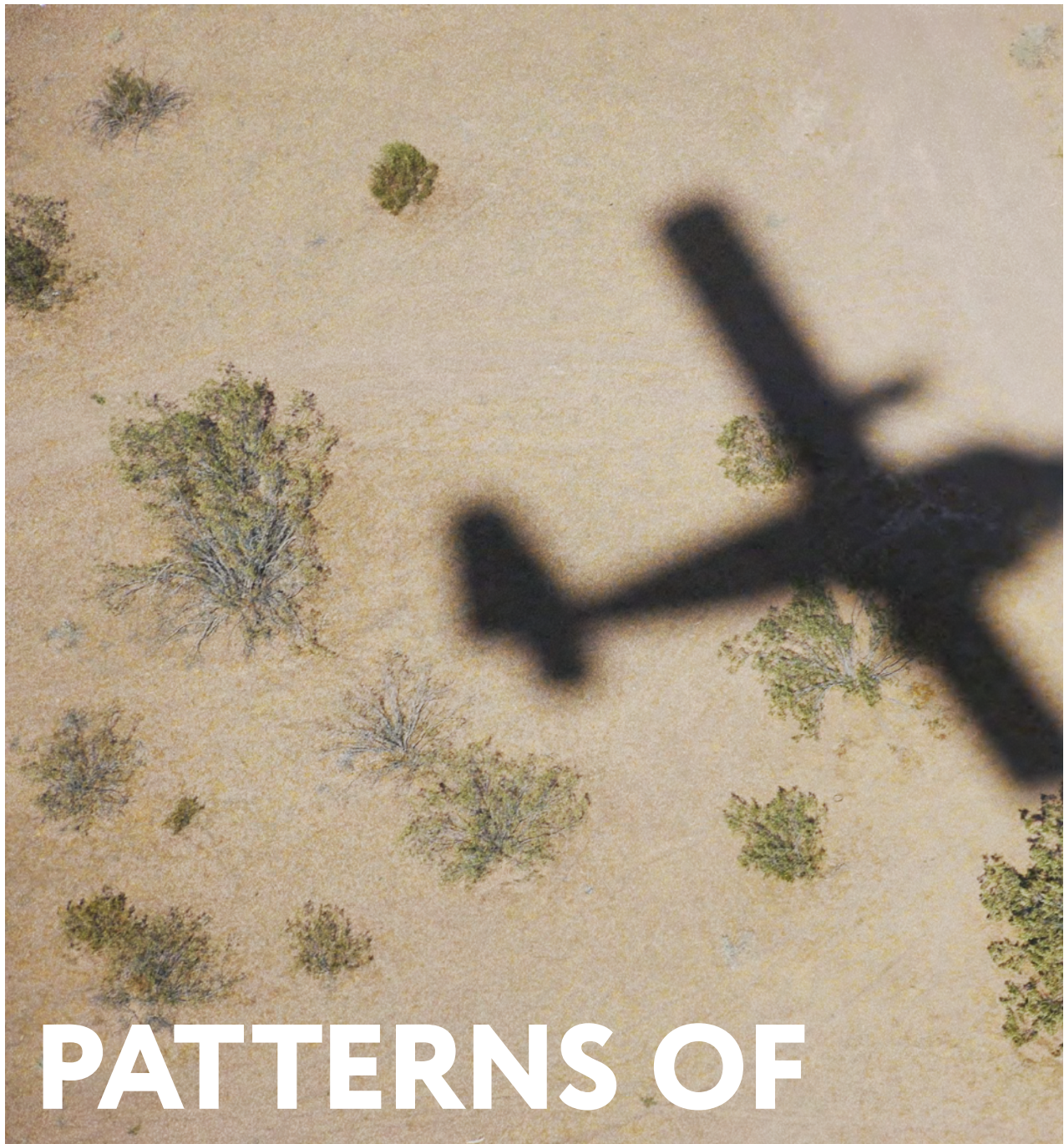
“LAMEs have a wealth of experience. Even if you’re an engineer, but from a different field, you may not fully grasp how changing an aircraft’s operating characteristics will stress the engine and airframe,” says Sam.

If you do maintain your own aircraft, keeping up-to-date and accurate records of what you do is essential. If there’s an incident, and your records of maintenance are incomplete, it could affect your insurance cover, slow investigations, and affect the value of your aircraft. 

// MORE INFORMATION

Get your free copy of the Good Aviation Practice booklet, *How to be an aircraft owner*, go to aviation.govt.nz/education to download or order your own copies.





PATTERNS OF RULE-BREAKING

Analysis of fatal accidents spanning the past 15 years has identified patterns of repeated rule-breaking prior to those accidents. »



» In one such accident, Safety Investigator Siobhan Mandich recounts a conversation she had with a witness as part of the post-accident investigation.

“He – the deceased pilot – was number two on my list”, Siobhan remembers the witness saying.

By “number two”, the witness meant the pilot was second on his list of pilots that he feared could die in an accident. Sadly, circumstances had proven his intuition correct.

“But if he was number two,” Siobhan asked the witness in bewilderment, “who is your number one?”

Months later, an investigation began into the witness’s ‘number one’.

Often, the challenge faced by accident investigators is the retrospective nature of their work. The bulk of safety-critical information starts flowing only after a catastrophic event. However, for Siobhan, this new investigation provided an opportunity to engage with a participant before their risky behaviour became a fatal accident.

“As we reviewed the files, a disheartening picture emerged – another ‘accident waiting to happen’ with a pattern of rule breaches against their name.”

Siobhan felt it was merely a matter of time before the pilot in question not only endangered themselves, but also potentially put passengers at risk.

The parallels between the recent fatal accident pilot (number two on the list) and the ‘number one’ were startling.

Siobhan highlights that early intervention from the CAA safety team often saves lives.

//CAA accident analysis has shown that pilots who repeatedly break the operating rules are statistically more likely to be involved in serious incidents or accidents. //

“If people have concerns about a pilot’s behaviour, they should report it. Taking early intervention, such as in this case, can potentially prevent fatalities.

“If you don’t say anything, then we cannot proactively improve safety,” says Siobhan.

From the files

CAA accident analysis has shown that pilots who repeatedly break the operating rules are statistically more likely to be involved in serious incidents or accidents.

“In one such example, a pilot was killed after crashing an aircraft for which he did not hold the appropriate pilot’s licence or medical certificate. He hadn’t received any dual flight instruction in that aircraft type, nor had flight hours been recorded in his log book.

“Sadly, this accident resulted in the death of not only the pilot, but his passenger,” says Siobhan.

Another example involving an Alpi Aviation Pioneer similarly shows how normalised rule-breaking can lead to tragedy. The pilot in question departed from Alexandra aerodrome for a group fly-in with other microlight enthusiasts heading to Stewart Island.

“Unfortunately, there wasn’t any adequate preflight planning conducted by the pilot. During the flight, he descended below 500 feet AGL, the minimum height for VFR flight in the area, and entered weather conditions below the required VFR meteorological minima,” explains Siobhan.

The investigation identified the cause of the fatality as controlled flight into terrain in poor weather conditions. The pilot was not instrument-rated, nor was his aircraft equipped for flight into IMC.

But Siobhan says the investigation also revealed a pattern of prior pilot rule-breaking.

“Video recordings retrieved from the pilot’s cellphone and tablet demonstrated unsafe flying practices, including low flying over water, and aerobatics. The pilot was not aerobatics-rated, nor was the aircraft approved for aerobatic flight.”

As the report states, “The conduct of these activities, which are in breach of the rules, is considered to demonstrate poor airmanship and reflects a propensity for risk-taking behaviour”.

Siobhan says the pilot had also been investigated several times by the CAA for alleged unsafe flying, ultimately resulting in his flying privileges being temporarily suspended.

“Additionally, witnesses said he had gone IMC within three months before the fatal accident.”



// **Safety Investigator Peter Stevenson-Wright:** "I've been to more than 30 fatal accident sites, from sea level to mountain tops, aerodromes to dense forests (I recall once having to long-line 200 metres from a state highway into extremely dense bush – it was the only option).

When we first started doing accident investigations, the gear we had was minimal and training was mostly theoretical. Now we have a recurring training programme and all the tools necessary for accident site investigations, including survival training to help us help ourselves, if we get caught out by New Zealand's rapidly changing weather in mountain or bush environments.

Safety is in my blood now. I truly believe the work the team does has meant more pilots educated as to what can happen when they fly outside the rules, which, in turn, has led to the reduction in the number of fatal accidents over the last 25 years."



Photo: CAA

Human factors research has found VFR pilots who deliberately entered IMC tended to have experienced the conditions previously and possessed a comparatively greater tolerance of risk.

"In essence, pilots who get away with pushing the boundaries set by the rules tend to make that behaviour their new norm, until one day they push too far," says Siobhan.

The rules are your safety guide

So how do pilots find themselves falling into a pattern of rule-breaking?

According to Safety Investigator David Oliver, one contributing factor could be a lack of personal ownership among pilots.

"Within our aviation culture, a number of pilots tend to absorb the rules through osmosis."

By 'osmosis', David is referring to learning from your surroundings, particularly from seasoned pilots who you hold in high regard.

"Nonetheless, the onus is always on the individual pilot to take ownership of their knowledge and understanding of the rules.

"If another pilot, or even a person in authority, tells you anything rule-related that you're not sure about, go away, sit down and have a look through the actual rules, or better yet, go through them together in person.

"The rules don't come out of thin air, they are drafted carefully to ensure anyone following them has a built-in safety buffer. But remember, they are the minimum safety standard and you should be aiming higher."

To create a safer flying environment, David underscores the importance of having open and honest communication between pilots about the rules.

"One time, after returning to New Zealand from a flying job in Papua New Guinea, I caught up with a good mate of mine, a fellow helicopter pilot, to discuss the rules and a time when I'd pushed the minima too hard.

"After telling him about my experience, he told me about a near-miss he'd had a few months before our catchup, where he'd mistakenly taken off with a long line still attached – he'd only just released it in time.

"I asked him why he hadn't mentioned this to me earlier. He hadn't broken any rules, but surely, I thought, he would have felt pretty sick if I'd done the exact same thing and killed myself, while he was keeping that experience to himself.

"It was only after speaking up and sharing my experience that he felt comfortable enough to share his. It's through discussions like these that lessons can be learned and trust can be fostered."

When asked about pilot opportunities to refresh on the rules and build their knowledge, David mentions the biennial flight review (BFR).

"You could complete your BFR with a new pilot or assessor so you can benefit from a diverse pool of experience and a fresh set of eyes.

"Your BFR is a golden opportunity to upskill and refresh over the rules. Rather than treating it as a two-yearly box ticking exercise, think of it as an upskilling opportunity.

"If you go into it with the mindset of looking for something new to learn and questioning yourself about the rules, you'll get a lot more out of it." ➤

MIKE'S STORY

Fatal accident stats are not just numbers.
They're real people who leave real people behind.

On 14 June 2019, Mike Evans was flying back to Queenstown after a Bell helicopter conference in Cairns.

When he landed in the late afternoon and turned on his phone he saw he'd missed several phone calls, and from people he would not normally hear from, in such a short space of time.

A bit preoccupied by this, he walked through into the arrivals hall, intending to pick up his car and drive home to Arrowtown.

Then he saw his wife, Kate, and their two children, waiting for him in the terminal.

"I knew straight away – it was Dad."

"He was a good father"

Mike can't remember the first flight he took with his father, Jim. Mike says he was just one year old – but he says he flew countless times with his dad over the years.

"I've got a lot of really good memories – from about the age of four – of flying with him. Piper Cubs, Cessna 180s, Bölkow 208s, all kinds of aircraft. There were local flights, cross-country flights, formation flying, banner towing, and night flying as well. Over the years, I sat in the corner of many smoko rooms listening to cool stories.

"I got my own PPL, and then he flew with me – me as pilot-in-command.

"And he was very good, very generous when it came to that sort of thing. He'd say, 'Oh, you know, you can sit in the left seat, and you can fly today'.

"I've got some fantastic photos of him and me in the cockpit together. Yeah, he was a good father."



Photo: CAA

// Jim Evans was the prime mover behind the Mercury Bay Student Aviation Trust – engineers and secondary students working together to construct a Van's RV-12. This is their first aircraft, MBA. Jim's influence, passion, and dedication to aviation continues. The trust's 5th aircraft is taking to the skies in 2023, and a 6th kitset is on order.

Jim was a pilot and aviation engineer, and Mike became a pilot and aviation engineer.

"We were close. He lived in Whitianga and I'm in Arrowtown, but we had a conversation every single Friday. It was just something that we did. If we didn't catch up at any other time, it would always be a Friday night phone call.

Giving back

The *Vector* team met Jim Evans on the sidelines of the Flying NZ national championships at Whitianga in 2015.

He was the prime mover behind a secondary school student aircraft build – teens and retired engineers working together on a Van's RV-12.

"He was very, very dedicated to the aviation community," says his proud son.

"He was a perfectionist. He liked things done right.



Photo courtesy of Mike Evans.

// Jim and Mike Evans during a 2014 preflight. "He was a perfectionist. He liked things done right." – Mike Evans.

// We were close. He lived in Whitianga and I'm in Arrowtown, but we had a conversation every single Friday. It was just something that we did. //

And, you know, there was no second best. He was a hard taskmaster to work with, and to work for. But working with those teens taught him patience."

The worst news

"The news at first was that Dad was just missing. You know, you have a sleepless night, praying that he'll be found overnight, and that it will all be well in the morning.

"The next morning, Kate and I were scheduled to fly to Auckland to stay with friends.

"We cancelled staying with the friends, but as soon as we landed in Auckland, we borrowed their vehicle and drove over to Whitianga."

"By the time we arrived, the rescue crews had discovered the wreckage, and they told us that Dad had died in the accident."

Mike could reconcile that his father had had an accident, that he'd hit the side of a hill and had died, but for him, the hardest part was not knowing what had happened just before that.

"Had he had a heart attack? Did he fall asleep, did he suffer, was his death drawn out? Was he in pain, did he die slowly of hypothermia?"

But the results of the CAA's investigation reassured him.

"He was very much awake, aware, and knowing what he was doing. Then, boom. He wouldn't have known anything. It was very, very quick and over and done with, so that was some comfort."

The CAA investigation found that, flying a return journey between Ardmore and Whitianga, Jim had relied on his aircraft's technology to fly him through instrument MET conditions.

The report concluded this was a result, possibly, of his familiarity with a route he'd flown many times, and the knowledge that the weather was clear at his destination. »

» The investigation found he'd engaged the autopilot after entering the correct altitude on his EFIS for his *usual* route between the two aerodromes, which took him over a saddle. But with the more southerly route he took that day, the altitude he entered meant his aircraft clipped treetops on higher terrain.

Mike says that, tragically, earlier in the day his dad had made a good call about not pushing the weather.

"He was wanting to land at Ardmore, but it was fogged in, so he diverted to Drury, but chose not to land there either because of weather.

"He'd made the right call, but I guess complacency caught him out because he'd done that trip so often. He knew he could get over the ranges at a certain altitude.

"But because he was returning from Drury, his track was further south than normal, and the terrain higher.

"Another 50 feet, he would have cleared the trees, and we wouldn't be having this conversation."

While he waited for the official report, Mike did some calculations about what might have happened.

"Let's say you've got visibility of 100 metres, and you're doing 110 knots, what's the timeline between you being able to see something, and the time that you hit it?

"Literally, you would have had probably zero point six of a second, or point seven of a second, between seeing something and hitting it. And unless you were a 20-year-old fighter pilot at peak performance, by the time you even recognise that there was something there, it would have all been over.

"So I don't think the average pilot would have even seen what was coming. One minute, you're sitting there thinking you're all happy. And the next minute, it's all over."

The aftermath

Mike says unless someone has been through the sudden death of a family member, it's difficult to understand how much is involved in the aftermath.

"There were all sorts of things I hadn't anticipated. There were some new aircraft parts in a box within the wreckage, which Dad had ordered, but wanted to return because they weren't the right ones. So I had to take care of that.

"And I had to quickly get up to speed on the financial and legal intricacies of the trust supporting the student aircraft build programme.

"You're taking care of these practical things, while you're also grieving, and trying to help other people with their grief.

"My stepmother, Sheila, who Dad was happily married to for a good 30 years, has been deeply affected by losing Dad.

"She was distraught when he first died, and to this day, she misses him deeply.

"As do we all. The intensity of missing him sweeps over me still. He's left a huge hole. We both worked in the industry and both knew or worked with the same people. We spoke the same language. Our Friday night calls were, 'Caught up with so-and-so and he said to say hi', or we'd discuss new modifications or technology. I miss those chats enormously."

A chat about the risks

Mike's 18-year-old daughter, Mikayla, finished off her PPL in July this year.

"I need to sit down with her and just have a chat about risks and things," he says.

"She's worked hard. And she's done it herself. And I'm very, very proud of her and her grandfather would have been proud of her.

"But I need to have a talk to her about risks and doing dumb shit. I think being a female, she's probably has less of the fighter pilot mentality than young men in their mid-20s. I know I did some dumb things.

"But, still, I want to mentor her and just watch over her for a while." ➤

// Mike says unless someone has been through the sudden death of a family member, it's difficult to understand how much is involved in the aftermath. "There were all sorts of things I hadn't anticipated." //



IT WON'T HAPPEN TO ME

It hasn't happened yet so it never will? Complacency can be a killer.

Imagine driving down a familiar country road, a route you've travelled countless times. As you approach an intersection, you cannot really remember ever seeing another car there.

"It's never busy", whispers your subconscious as you approach the intersection. "I'm not going to see another car, I've done this so many times. I am safe."

However, one fateful day, as you pull out onto the intersection, without pausing to check, a car whizzes past in front of you, forcing you to slam on the brakes violently.

Alaska White, CAA's Chief Advisor of Human Factors, says that just because something bad or negative hasn't happened yet, doesn't mean it won't.

"The absence of stimuli (for example, coming across another vehicle or a negative event) reinforces the belief that nothing bad will happen, luring the person into a false sense of safety. Slowly, you begin to stop doing the checks and procedures that you would always do at a busy intersection, like slowing down and checking for oncoming vehicles. It's only when you encounter an adverse event that you get a bit of a reality check.

"This complacency is why, for instance, despite the obvious oncoming vehicle, the driver's attention isn't directed to where it needs to be," says Alaska.

Neither way of thinking is helpful

Organisational psychologist Keith McGregor – formerly RNZAF – distinguishes between two differing components of our thinking system, when we're assessing risk.

"The 'cognitive' – or analytical – aspect involves us evaluating the risk in a situation, based on factors like our experience, the prevailing conditions, and how we assess our skill level. Unfortunately, we as humans aren't very good at this – we tend to underestimate the risks but overestimate our ability to counter them."

To reinforce this point, Keith discusses a study in Florida focussed on instructors, their students, and their perception of risk around flying. Surprisingly, the results showed 73 percent of instructors thought flying was not risky, and 60 percent of their students shared the same sentiment.

"Denial ain't just a river in Egypt," Keith quips, quoting Mark Twain.

"On the other hand, the emotional aspect of our thinking system deals with factors like the pressure we face to fly. This is where get-there-itis can creep in. Our personality type also comes into play, here, like a 'macho bravado' type approach to getting the job done.

"When we switch to emotional thinking our capacity to think logically is diminished, a state often described as 'porridge-brainism'.

"One study looked at pilots who continued VFR flight into IMC after making inaccurate assessments of visibility early in the decision-making process. These assessments were compounded by their poor risk perception, overconfidence in their flight skills, and a reduced sense of vulnerability to weather hazards and pilot error. To break this pattern, when feeling under pressure, a simple trick is to think, 'What would I tell a student pilot to do right now?'" »

» Even experienced pilots...

Alaska says many fatal accidents involve 'local' pilots who knew their crash sites very well, having considerable experience and local knowledge.

"People assume that very experienced pilots are infallible, but that hasn't stopped very experienced pilots having accidents.

"While experience and training will undoubtedly better prepare you for handling unexpected challenges, the environment you operate in is dynamic and unpredictable.

"The conditions you fly in today aren't the same as those 10 years ago, 10 months ago, or even yesterday.

"You need to ensure you're not blindly accepting and using yesterday's conditions to justify your decisions for today. Each flight is unique and needs to be treated as such."

Keith recommends, no matter how experienced you are, taking five before the flight.

"Take five minutes just to review what's going to happen, what the risks are, and how you're going to manage those risks. You can build this into your pre-take-off checklist and eventually it will become as routine as checking the fuel," says Keith.

Alaska explains that human factors impact on performance, regardless of what your role is, and don't exist in isolation.

"What I mean is that the 'human factors' (for example, attention, workload, stress, sleep quality, fatigue, pressure, teamwork, decision-making, complacency and so on) all affect each other. And that applies to experienced pilots as much as inexperienced pilots.

"For example, quality of sleep affects your attention (including situational awareness). It contributes to fatigue. It affects how you cope with daily stressors and your decision-making abilities, as well as how effectively you communicate, and your relationships.

"Then these factors affect each other, influenced by things like your personal life, work conditions, finances, mental and physical health, and age.

Prepare your mind for success

Drawing on his insights from sports psychology, Keith says 'visualisation' can be just as effective as physical practice in improving and maintaining performance.

"With clients, I employ a process I call 'embedding' – literally because it happens in bed.

"During moments of quiet reflection before sleep, take an event from a flight you handled poorly, identify what you should have done differently, what the result should have been, then repeatedly rehearse the improved response mentally.

"Our behaviour is heavily habit-driven and those habits help our brain conserve energy.

"Learning a new skill does take a lot of conscious effort and practice while your brain works to make synaptic connections. However, once you've learned the new skill, it becomes habitual.

"By visualising a behaviour properly, and mentally practising it, you're more likely to default to that behaviour in the future, especially under pressure."

When visualising, make sure you emphasise what you could have done better to improve the situation. This is called 'upwards counterfactual' thinking. For example, you could say, 'If I'd re-checked my altitude beforehand, I would not have busted airspace.'

This type of thinking leads to positive behavioural changes – learned from mistakes.

In contrast, 'downwards counterfactual' thinking involves regretful thoughts, such as, 'I shouldn't have done that – if only I hadn't...'. This type of thinking does not lead to behavioural change.

Keith emphasises the significance of this reinforcement process and its impact on our beliefs and behaviours.

"When I run workshops, I ask, 'How many of you have problems remembering names?' Most of them put their hands up.

"I get them to all say out loud, 'I'm brilliant with names', even though many of them initially don't believe it. But guaranteed, if they repeat each day, 'I am brilliant at remembering names', that positive reinforcement will make the synaptic connection, and they will become better at remembering names.

Bizarre scenarios can help

An Australasian study involved airline pilots dreaming up bizarre scenarios and pitfalls during flight, quizzing each other about what they would do. When surveyed after the study, 95 percent of respondents expressed the opinion that they had learned from the exercise and would be better prepared in the future as a result, and 98 percent indicated that they would continue to discuss novel scenarios, even after the project had finished.

“Reading some really far-fetched occurrences,” says Alaska, “that may have happened to a pilot over in the United States or Europe might not appear directly relevant to you, but you can probably guarantee the people affected thought these far-fetched things wouldn’t happen to them either.

“The exercise of thinking about the ‘what ifs’ and contemplating how you’d respond to such situations, can prove beneficial in avoiding an incident or accident.”

Having hard conversations

For those concerned about a family member’s flying behaviour, Keith has some advice on how to broach difficult conversations. This advice comes from his experience in intervening with farmers, whose families and friends were worried about their emotional wellbeing.

“You could start with, ‘I have a problem I need your advice on’, thereby framing the conversation in a collaborative tone.

“A follow-up to this could be, ‘My problem is that I am not sure of the best way to raise my concern without causing offence?’

“Most people will respond with something like ‘That’s fine, just go for it, tell me’. The critical aspect here is that they have given their permission to discuss the problem.

“You could follow this up with, ‘My problem is that lately, I’ve noticed this behaviour – I’m worried about you and your flying. What is the best way for me to discuss this with you?’

“This way, the pilot feels that their wellbeing is the primary focus, rather than getting defensive.”

For pilots who operate in more isolated settings, such as small husband-and-wife operations, Keith suggests conducting monthly audits of the past month’s flying.

“Setting aside time specifically for reflection and self-improvement will help you identify problem areas.

“However, make sure you analyse flights that went well too, not just the problematic ones.”

Overseas research has shown that if problem areas exist, the same mistakes and patterns of behaviour will be revealed during investigation of flights you think went well. You’ll identify that the negative outcome has been avoided only through sheer luck.

“This highlights the importance of thoroughly evaluating all flights to identify potential risks, and assessing the effectiveness of your existing defences against those risks,” says Keith.

You could break your analysis down into:

- What are the foreseeable risks of flying to that place, today, in these conditions?
- What checks and balances are in place to manage those risks?
- Will those checks and balances actually work? ➤

// MORE INFORMATION

Go to aviation.govt.nz/vector-online and scroll down to the article 'Everybody knew'.

// By visualising a behaviour properly and mentally practising it, you’re more likely to default to that behaviour in the future, especially under pressure. //

RESOURCES

If you, or a family member, are struggling or feeling overwhelmed, and need immediate support, the following free help is available.



Call or text 1737

1737 – *need to talk?* is available 24/7. Trained counsellors are at the other end of the line and will listen to you, focussing on supporting your needs.



victimsupport.org.nz

Victim Support provides resources and information about coping with grief and trauma.

It also provides practical information like how to deal with the coronial process, or manage media interest, as well as how to help others who may have experienced the sudden death of a family member or friend.



skylight.org.nz

The Skylight Trust supports anyone in New Zealand who's facing any kind of tough life situation.

It specialises in grief, loss and trauma, but provides many other avenues of help including courses, workshops, and webinars on things like resilience and family change.

