



VFR INTO IMC

Part Three

It's not just VFR pilots who need to be aware of the dangers of entering instrument meteorological conditions.



In the second part of this series on VFR pilots entering instrument meteorological conditions, we said, “One of the surest ways of a VFR pilot dying in an IIMC¹ encounter is a lack of robust planning”.

But planning to avoid IIMC applies to IFR pilots as well.

Operations Manager for the Hamilton-based Westpac Air Ambulance, Massey Lynch, trains VFR pilots to avoid IIMC.

To illustrate how even an IFR-rated pilot must plan, he uses the example of an Italian IFR AW139 pilot going IIMC, in 2017, resulting in the death of all six occupants.

“He was in an extremely capable aircraft,” says Massey. “He was very experienced, and although not IFR-current, he was a qualified IFR pilot.

“Despite fog-like conditions at the time of departure, when visual reference was lost in snow, he may not have been prepared with an escape flight path, despite being in a familiar area. He may have attempted to continue to fly by visual reference after becoming lost and disorientated.

“The aircraft crew and patient, with nothing more than a broken leg, may well still be alive, if instead, he’d pre-planned an extraction and reviewed it, for familiarity, in the minutes before departure. Then, when he started to lose reference, he could have transitioned to instruments

and climbed according to the extraction plan, likely a heading aligned with the valley.

“Better still, after planning the instrument extraction, his awareness may have been heightened about the severity of the conditions and the lack of good options, and he may have stayed on the ground.”

The role of trainers

The online aviation library, SKYbrary, says pilots must understand that unless they’re trained, qualified, and current in the control of an aircraft solely by reference to flight instruments, “they will not be able to do so for any length of time”.

But the CAA’s Chief Advisor of Human Factors, Alaska White, warns training can have unintended consequences.

“Instructors need to clarify for their students that, just because they become comfortable using instruments in normal flight, that does not mean they’ll be proficient using only instruments in IMC.”

“Otherwise your VFR student may begin to believe they are skilled enough using instruments to enter and deal with IMC.” »

¹ Also known by the ICAO term, UIMC - unintended entry into IMC

// Flying in poor conditions becomes 'the way things are done around here' //

Good information to make sound decisions

CAA Chief Meteorological Officer Paula Acethorp says some pilots are using free online weather tools that, "do a great job in their presentation of data, but rely on a single weather model that may not capture the current weather situation.

"Particularly on marginal weather days, these tools can't provide the whole picture that a pilot needs. They may indicate only whether it's likely to rain, but not what the visibility reduction will be, let alone what the expected cloud ceiling is.

"When using tools like these for flight planning, how will a pilot know they'll meet VFR requirements?"

Paula advises a better choice is a Part 174-certificated forecast, available to pilots via Part 174 briefing sites, listed in the *NZAIP*.

"These forecasts are created by considering a range of different weather models and comparing them with what the actual weather conditions are – which model is telling the most likely story?"

"The forecaster then adds in further expert knowledge to account for details that weather models can't yet resolve, such as how the Nelson ranges can protect Wellington from rain during a wet, westerly flow."

Referencing Kobe Bryant's pilot, Ara Zobayan, not including more recent weather briefings in his flight risk analysis, Paula stresses the importance of checking for weather updates as part of preflight activities.

"Sometimes the weather doesn't evolve as expected, so the meteorologists issue forecast updates – or perhaps a new model run has come in, changing the timing of when a weather feature passes through.

"Pilots should make sure they have the latest forecast before taking off."

» The role of the commercial operator

In 2020, nine people were killed in a helicopter crash in California, including the basketball star, Kobe Bryant. The US National Transportation Safety Bureau found that the helicopter's operator, Island Express Helicopters, did not have in place a sound safety management process². The NTSB said this contributed to the crash.

On the day of the fatal flight, the pilot only partially completed a flight risk analysis form, ignoring updated preflight weather information. This kept the flight risk score low enough that he didn't have to discuss the intended flight with his company's operations director, nor develop an alternate plan.

There was, the NTSB found, a lack of documented policy and safety assurance evaluations to ensure Island Express pilots were correctly completing the flight risk checklists. It said the operator should have made sure its pilots were "consistently and correctly completing the flight risk analysis forms...".

Back in New Zealand, some operators in the most complex environments haven't even started using preflight risk analysis.

CAA Investigator Jason Frost-Evans says a recent investigation identified an issue with operators not ensuring that appropriate meteorological information was provided to pilots.

"This issue appears to be widespread," he says. "Pilots need good information to make sound decisions [see sidebar]. But many certificated operators aren't even subscribing to the appropriate service, despite it being a necessary resource to ensure they comply with prescribed safety standards."

In the Autumn 2021 *Vector* article, "The braver decision", Jason said of pilots under operational pressure to fly in poor conditions, that if they fly – against their better judgement – and don't have any difficulty, next time they may be less concerned.

Eventually, Jason says, flying in poor conditions becomes 'the way things are done around here'.

Alaska White says such deviations from standards become institutionalised as a result of behaviour modelled to younger, less experienced pilots by the more proficient pilots that they admire.

"Or the pilot's under peer or management pressure, or they're complacent because they've not been caught, corrected, made accountable or faced negative consequences... yet.

2 NTSB Report AAR2101

“Unless those pilots – and the supervisors who send them out into poor weather – are challenged and corrected by colleagues, peers and managers, their decision-making will further drift from safe practice.

“Their comfort zone for deviance expands until they completely lose sight of why standards and safety limits were there in the first place. Until it’s too late.”

The role of tech

Is there a role for technology in bringing down the number of pilots who inadvertently enter IMC, or who chance it deliberately?

New research from Griffith University³ in Queensland thinks there might be.

“Continued education of pilots, aiming for behaviour change, continues to be important,” says Anthony Stanton, lead author of the research.

“But our study – which was mainly of pilots who’ve at least once intentionally entered IMC, and who largely over-rate their flying ability – found that changing the attitudes of such pilots is up against some pretty resistant human thinking.

“Our research poses the question, ‘How could technology help to change pilot behaviour, as they’re making that decision to fly toward or near IMC?’

“For instance, ADS-B and electronic flight bags allow general aviation craft to transmit their location and be tracked. Safety systems could be developed by integrating normally unrelated information sources to provide a proactive adverse weather advisory service to pilots considered to be at risk of attempting entry into IMC.

“Any such service could be initiated by an air traffic controller, for instance, as the pilot is taxiing for departure. A sort of ‘are you sure?’ opportunity to give them pause about their decision.

“We’re not proposing the exact science that could do this. But we hope aviation regulators worldwide will pick up the conclusions of our research and invite their tech industry to come up with some innovative ideas about how it might be developed.” ³

The tech already with us

“If your operation is at high risk of IIMC,” says Jason Frost-Evans, “then from a risk management perspective, you should equip with reasonably practicable risk controls.

“These could include flying two pilot, and/or with an autopilot which can stabilise the flight path and reduce the workload for the pilot flying.

“Or Synthetic Vision Systems – SVS – which combines three-dimensional data into pilot-friendly displays to provide improved situational awareness.

“Or the latest TAWS and helicopter TAWS – terrain awareness and warning system – which work out the precise three-dimensional position and speed of the aircraft in real time, relative to terrain height and locations of hazards, and give alerts if predetermined criteria are met.

“Remember the first rule of risk management is to eliminate the risk if possible. If you can’t, then do everything else possible to minimise it.

“Pilots and operators need to employ everything available – psychological, operational, and technological tools – to bring down this seemingly resistant toll of tragic accidents.”

// FOR MORE INFORMATION



Weather and aeronautical information in the one place: gopreflight.co.nz

56 seconds to live campaign
United States Helicopter Safety Team
ushst.org/56secs



178 seconds to live video
Civil Aviation Safety Authority YouTube video



Download or request a free copy of the Good Aviation Practice booklet, *VFR MET*, at aviation.govt.nz/education.

³ Stanton, A. A. (2022) 'Gathering Clouds' A study of plan continuation, risk, rules and pilot behaviour, [Unpublished doctoral dissertation]. Griffith University.